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BCM50

Technical Configuration Guide

➢ BCM50 with Mediatrix ® 1102®
➢ in a Direct Gateway Environment

Sales Engineering
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Abstract

This document is intended for anyone wanting to configure and utilize a Mediatrix 1102 as an analog gateway off of a BCM50. Although this document focused on the BCM50, the configuration could be ported over to the BCM 200 and 400. The solution utilizes the capability of the BCM to allow an incoming call from the PSTN to tandem through to a Voice Over IP (VoIP) trunk terminating to a Mediatrix ® analog gateway.

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1. Overview: BCM50 to Mediatrix ® Analog Gateway in a Direct Gateway Environment

Analog gateways are becoming more of a necessity in the enterprise to provide faxing capabilities over Voice Over IP (VoIP) networks. The gateway handles the responsibility of transcoding the analog call to IP using VoIP standards. These gateways interoperate with core VoIP telephony servers.

For the purpose of this document the Mediatrix ® 1102 ® was utilized as the analog gateway and the Nortel Business Communications Manager 50 was utilized as the VoIP telephony server. This document is intended to be a Technical Configuration Guide to show a working configuration utilizing the Mediatrix ® gateway and the Nortel BCM50 to allow analog devices to make calls across the VoIP network.

The solution utilizes the tandem capabilities of the BCM50 to allow incoming calls to be routed from one trunk, in this case a PRI, to a VoIP trunk terminating on a Mediatrix ® 1102 ® gateway.

2. Base Scenario:

The BCM400 was connected to the BCM50 to emulate an external switch. The analog gateway was configured to utilize a direct IP trunk back to the BCM50 over the Ethernet network. Only one port on the Analog gateway was configured with an alias, in this case a phone number.

The Enterprise Switch 470 was configured with a basic IP address for management as well as an interface group to trust the incoming Diffserv Code Point (DSCP).

2.1 Assumptions:

This document assumes that the reader is knowledgeable on the programming of the BCM50. It does not go into detail on any basic configuration options. The document focuses on the necessary configuration to make the tandem function work with H.323 trunks to the analog gateway.

All IP components have to be accessible so that signaling and media path can connect appropriately.

The BCM50 will need to have the VoIP trunk license key loaded to support the H.323 connectivity to the analog gateway. VoIP trunks are assigned to a BLOC. In this configuration BLOC A is used for the VoIP trunks.

The one BCM50 is configured in a Pool, in this case BLOC B.

Since the Mediatrix® is on the LAN side, only G.711 mu-law will be utilized. T.38 Fax support will be disabled.

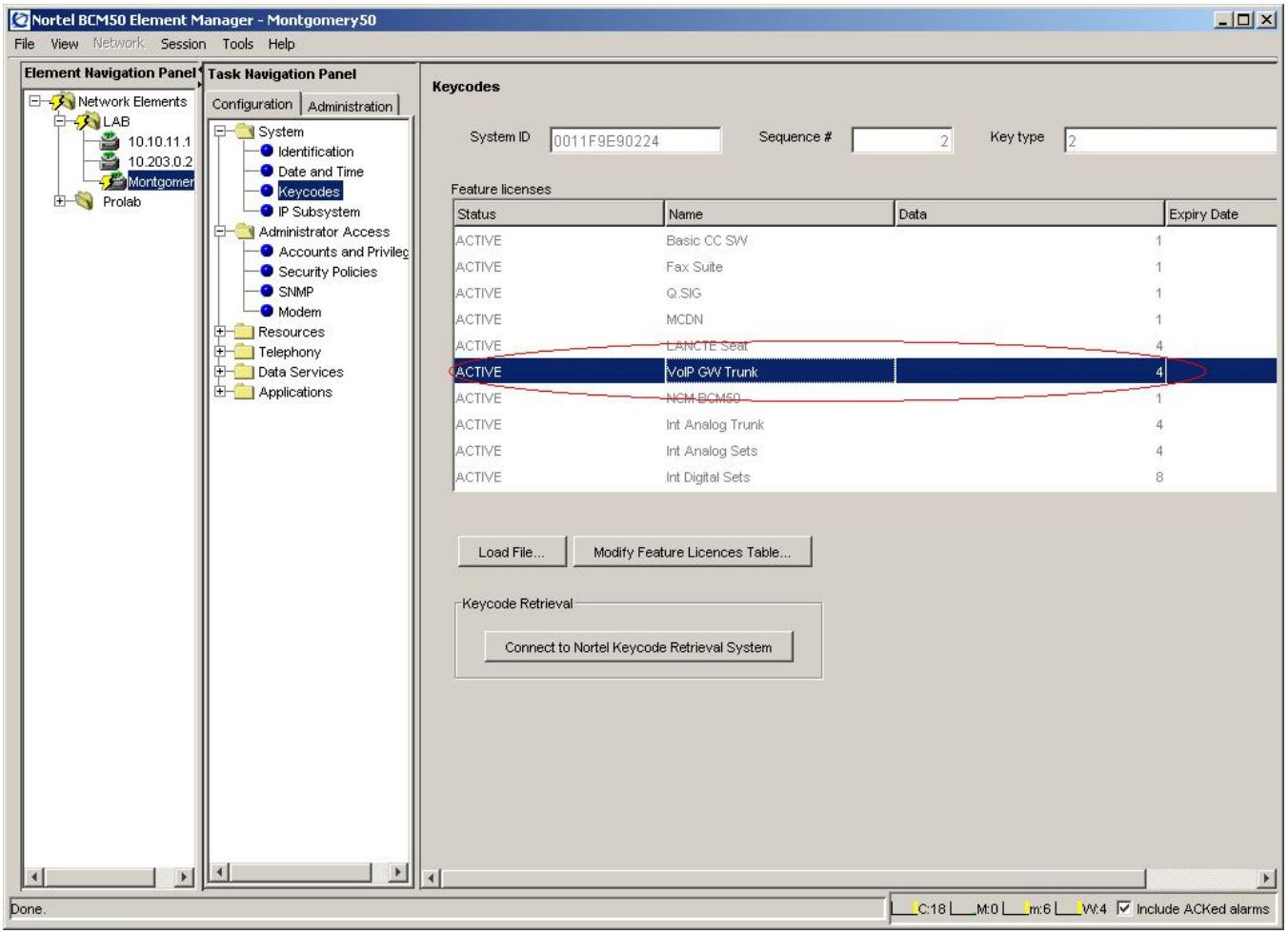

Figure 1

Hardware Matrix

Manufacturer	Platform	Model	Version
Nortel ®	BCM	50	1.1 with cumulative patch 1
Mediatrix ®	Analog Gateway	1102 ®	4.0.12.47
Mediatrix ®	Unit Manager Client		3.2.17.40
Nortel ®	Enterprise Switch	470	3.6.0.6

2.2 Objectives:

The objective of the testing and configuration was to extend analog capabilities to a Mediatrix ® analog gateway from a BCM50 over a VoIP network. This allows users to deploy devices such as analog phones across a VoIP capable network allowing a reduction in cable infrastructure.

2.3 Topology:

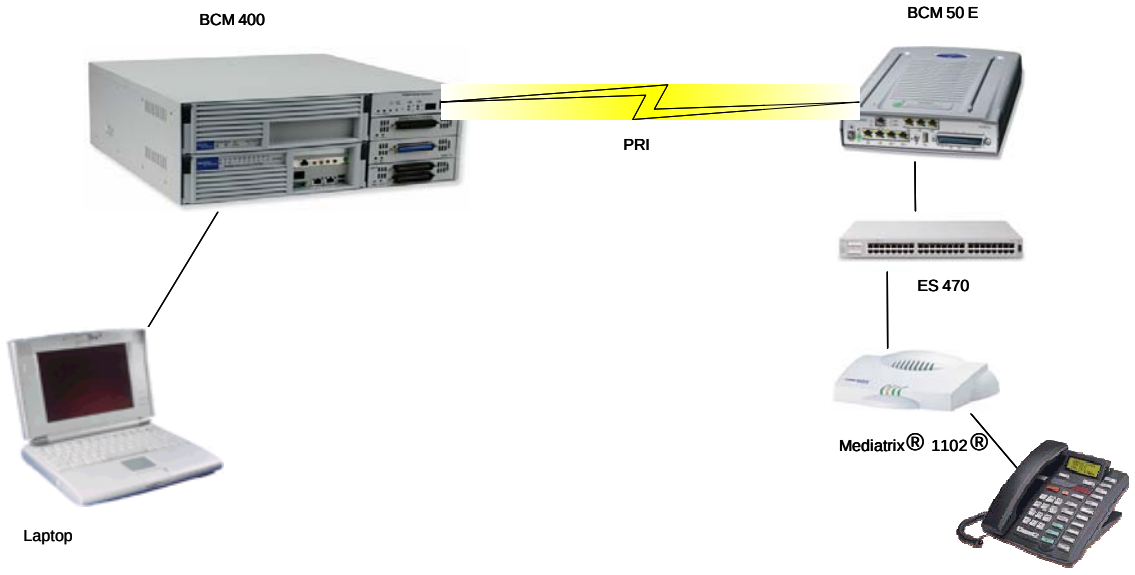

Figure 2

A PRI between the BCM400 and BCM50 was provisioned to provide external telephony access to the BCM50. The BCM50 is Ethernet attached to the ES 470. The Mediatrix ® 1102 ® is Ethernet attached to the ES 470.

The BCM400 has an analog station module (ASM) to provide analog connectivity to the laptop. The analogue device is attached to analog port 1 on the Mediatrix ®.

2.4 Configuration Steps:

2.4.1 BCM50 Configuration

2.4.1.1 Call Routing Configuration

The BCM50 will need to be configured with a call route to the gateway. In this setup, route 003 will be used with a DN type of National. The DN type is very important when configuring trunks. The Mediatrix ® will also be configured with a DN type of E.164 which is what is equivalent of National. These must match.

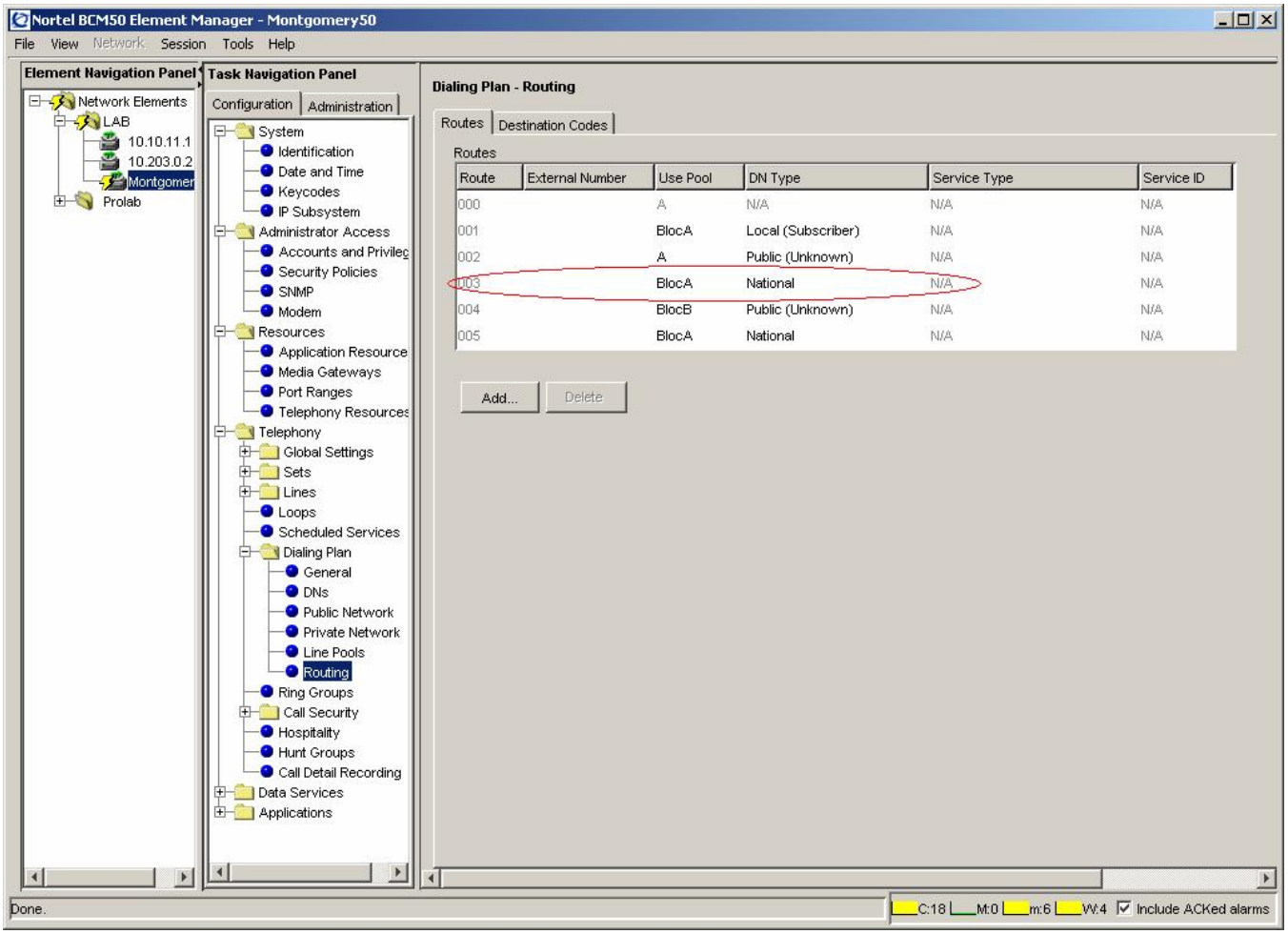

Figure 3

2.4.1.2 Destination Code Configuration

A destination code is defined on the BCM to access the Mediatrix ® analog port. For this solution, we used the entire 7 digit phone number associated with the analog phone on the gateway as the destination code and set the Absorbed Length to 0 so that all digits would pass to the Mediatrix ®.

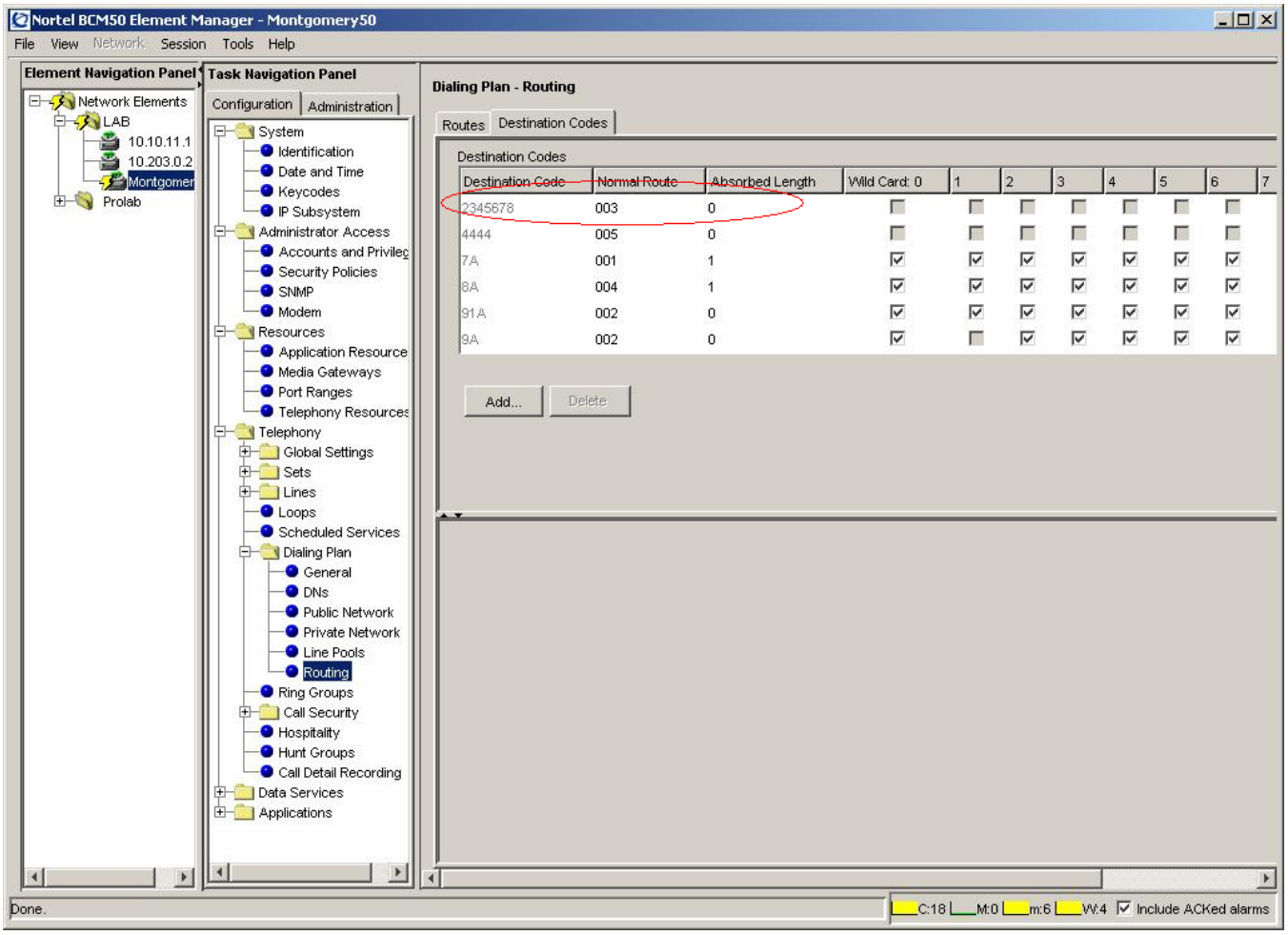

Figure 4

2.4.1.3 PRI Route Configuration (External Trunk)

The PRI route is defined on the BCM50 with a DN type of Public (Unknown). For this setup, route 004 was utilized.

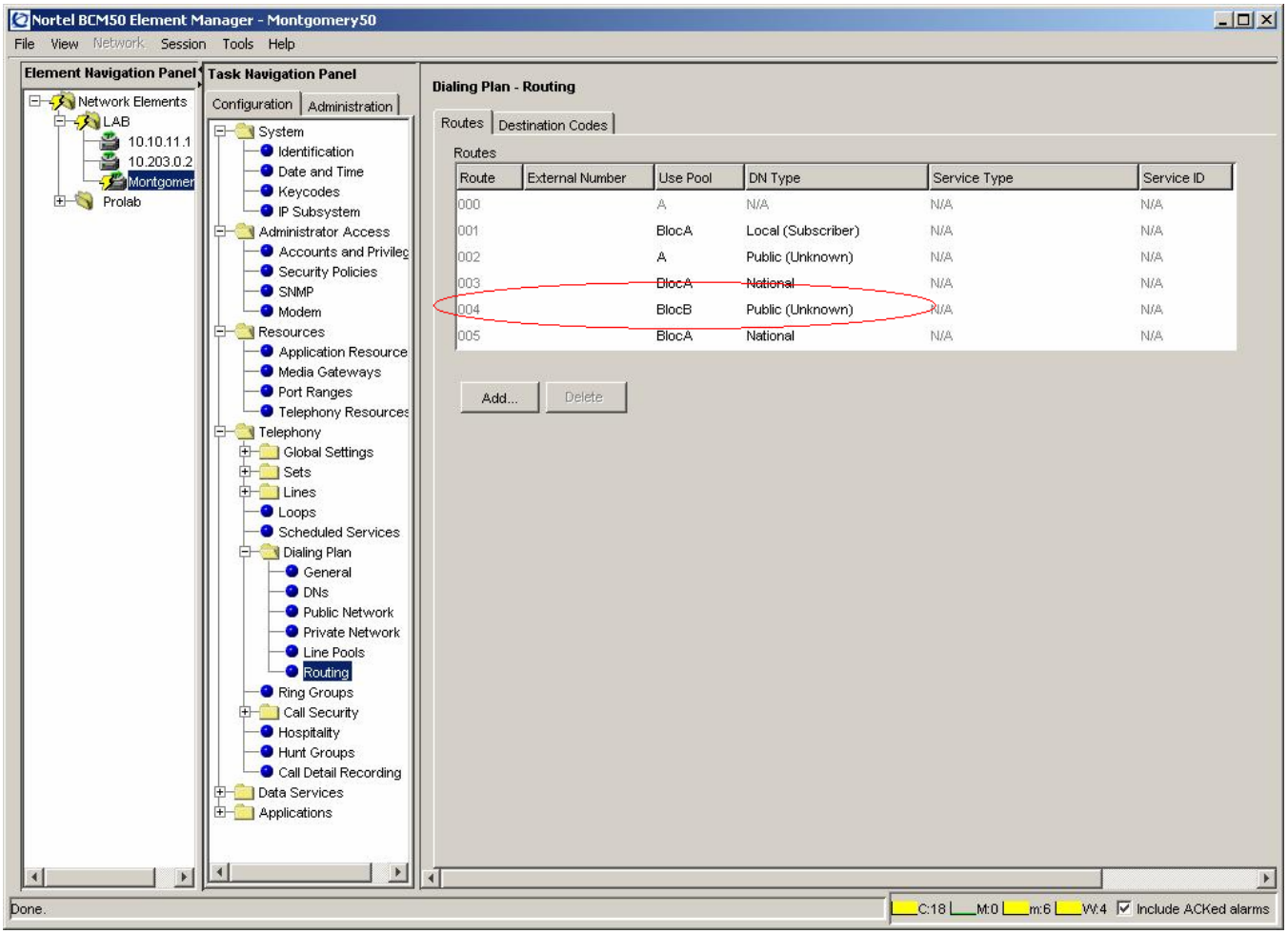

Figure 5

2.4.1.4 Remote Access Package Definition

For calls to tandem from one trunk to the other, a remote access package must be configured and all lines within the pool associated with the tandem trunks need to be assigned to the remote access package.

Enabling the remote access package:

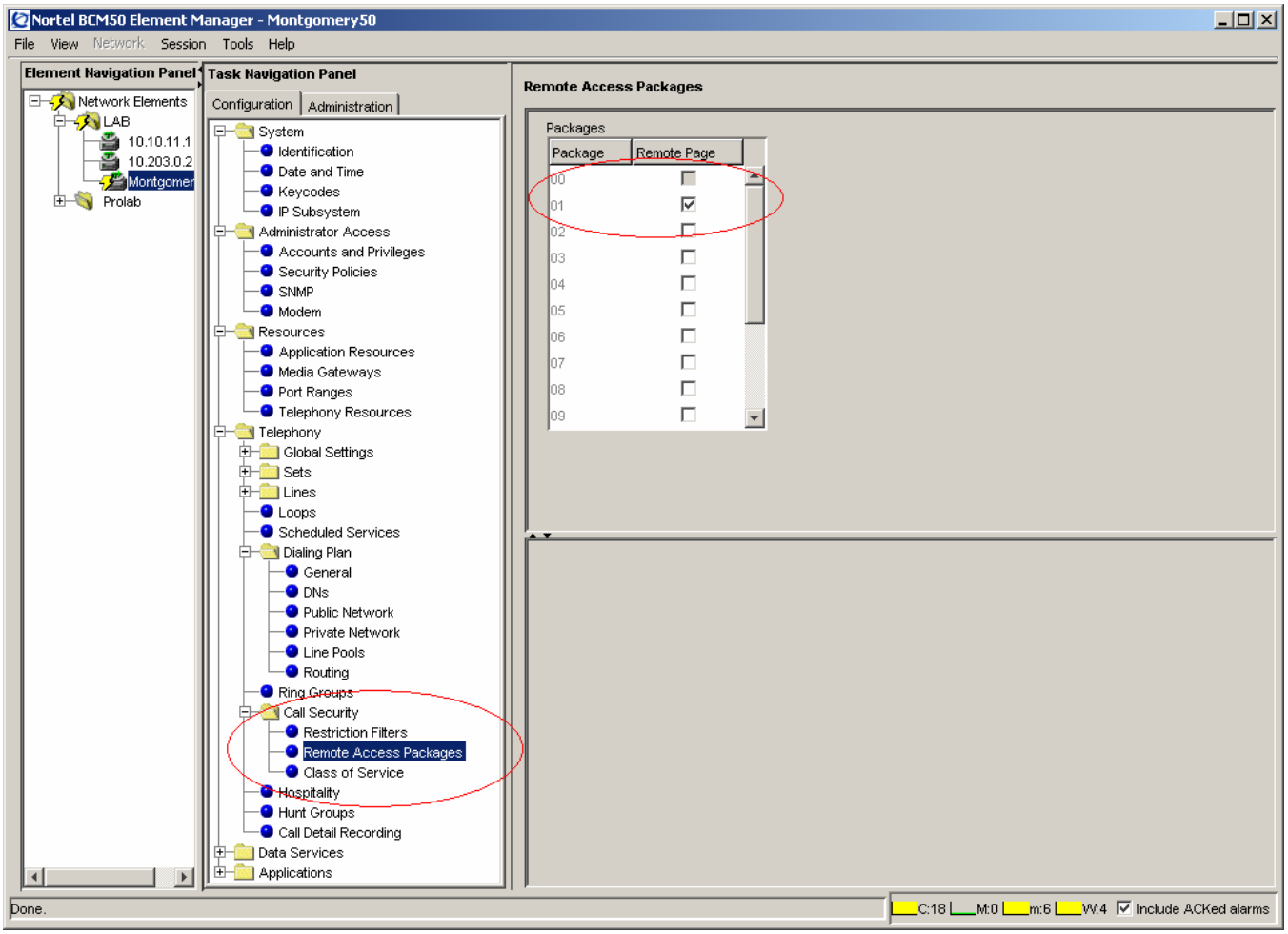

Figure 6

2.4.1.5 Remote Access Package Line Assignment

Adding the IP Lines to the remote access package:

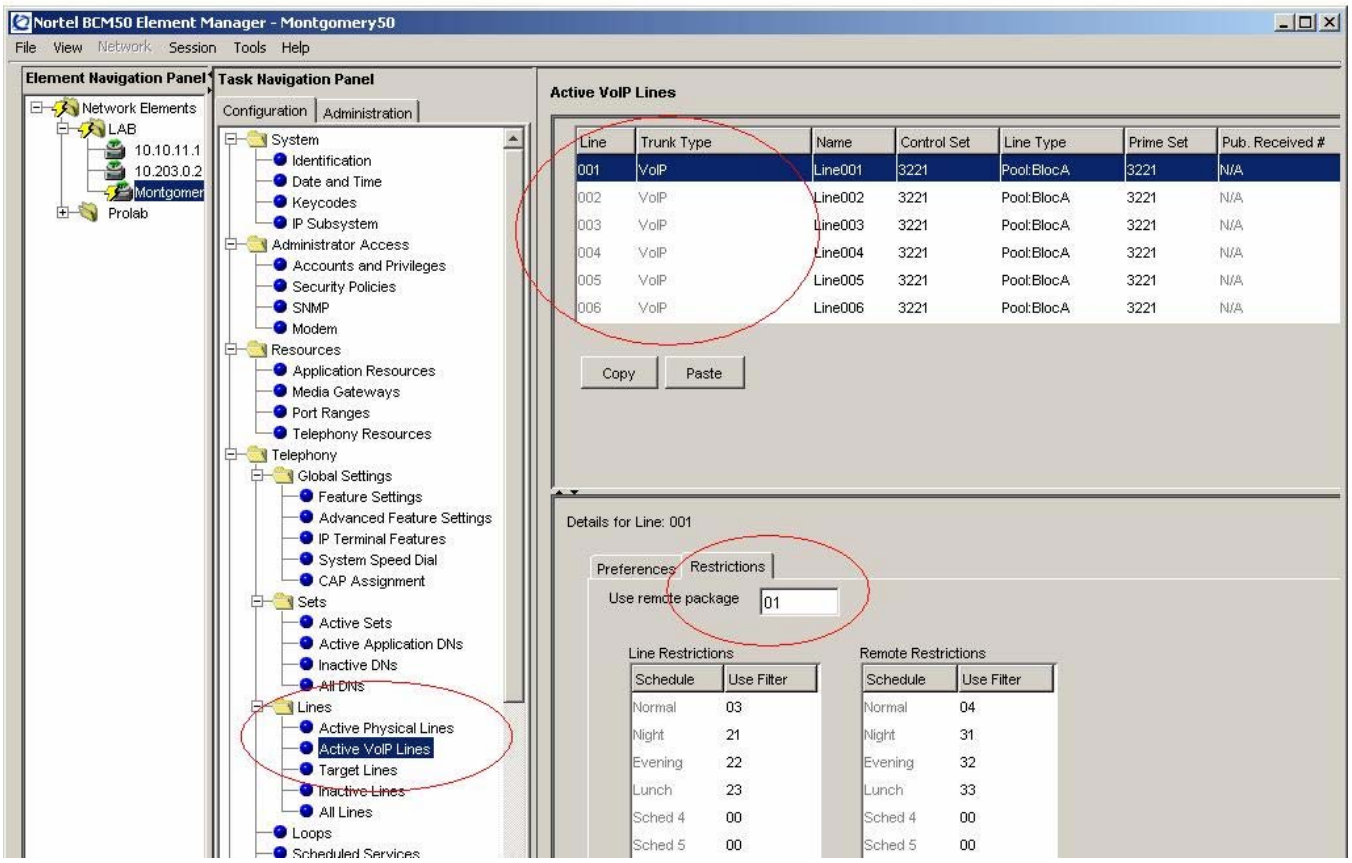

Figure 7

Adding the PRI lines to the Remote Access Package; in this configuration, the PRI falls into lines 65-87.

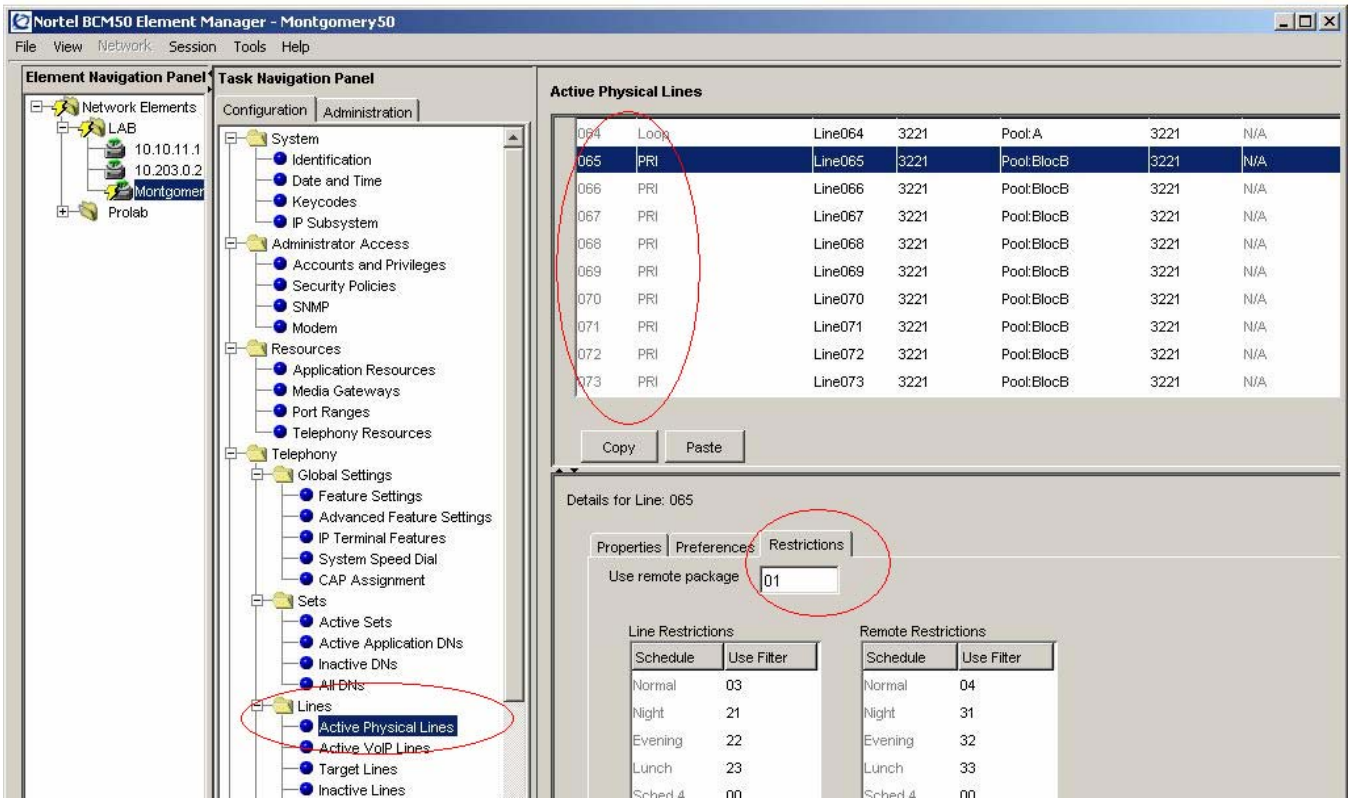

Figure 8

2.4.1.6 H.323 Direct Configuration

For these tests the BCM50 was configured to support a direct connection to a remote VoIP gatekeeper. Utilizing a gatekeeper was not tested.

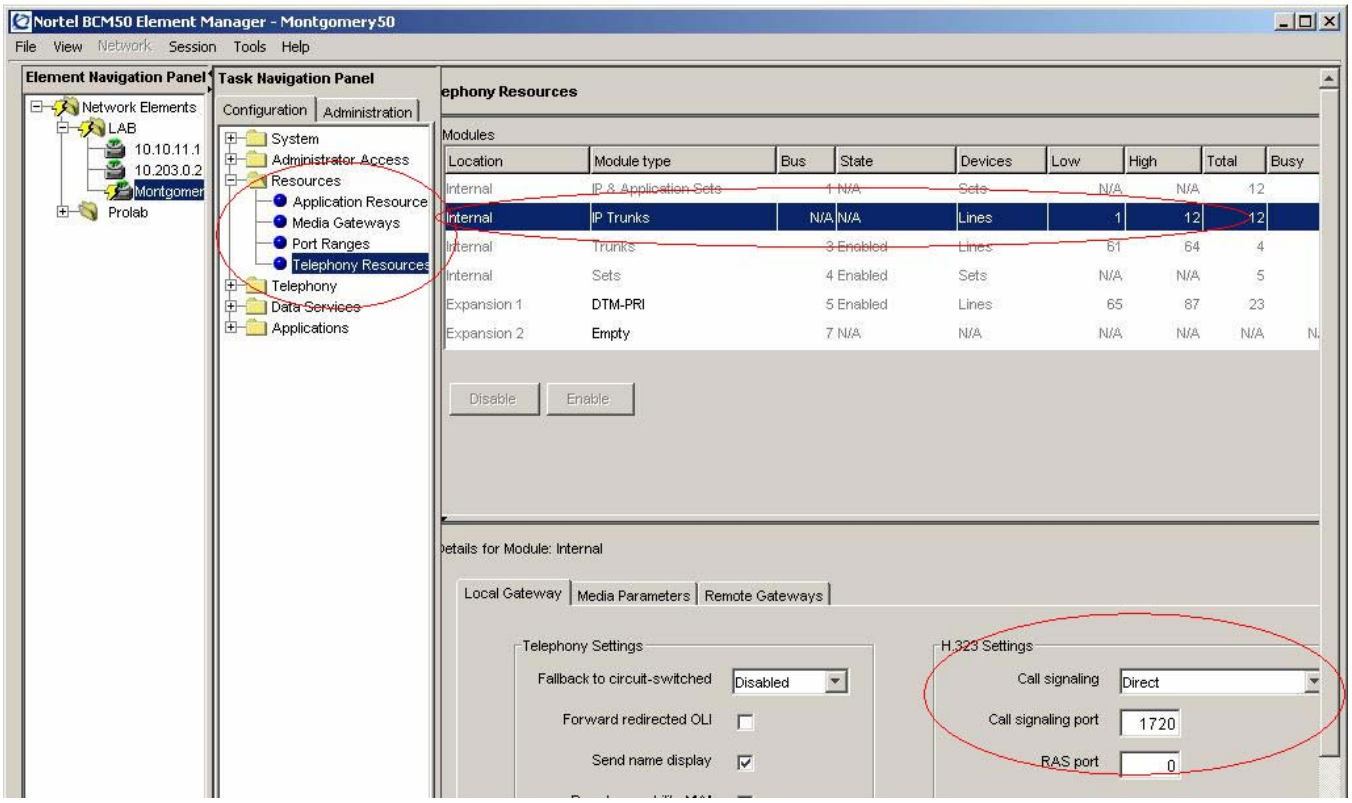

Figure 9

2.4.1.7 Remote Gateway Definition

The Mediatrix ® now needs to be defined as a remote gateway. The IP address of the Mediatrix ® is defined along with the destination digits used for the port on the gateway associated with the analog device. In this configuration 2345678 was used. This matches the destination digits previously defined for the call routing destination digits. This allows for calls, once routed to the IP trunks, to match a specific remote gateway based on the dialed digits. The gateway type is set to BCM30 for H.323 support with no gateway protocol.

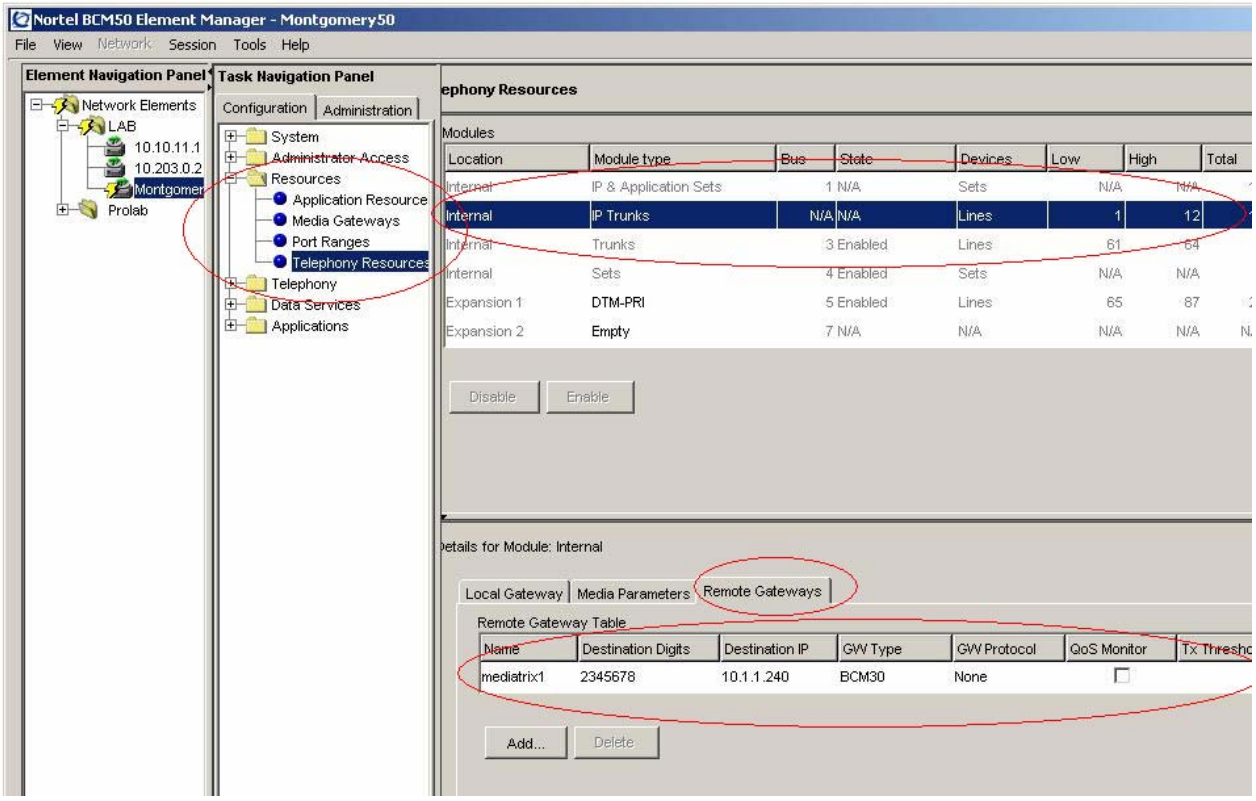

Figure 10

2.4.1.8 BCM50 Codec Definition

The Codec is set to G.711 mu-law and T.38 FAX is disabled under the Media Parameters Tab.

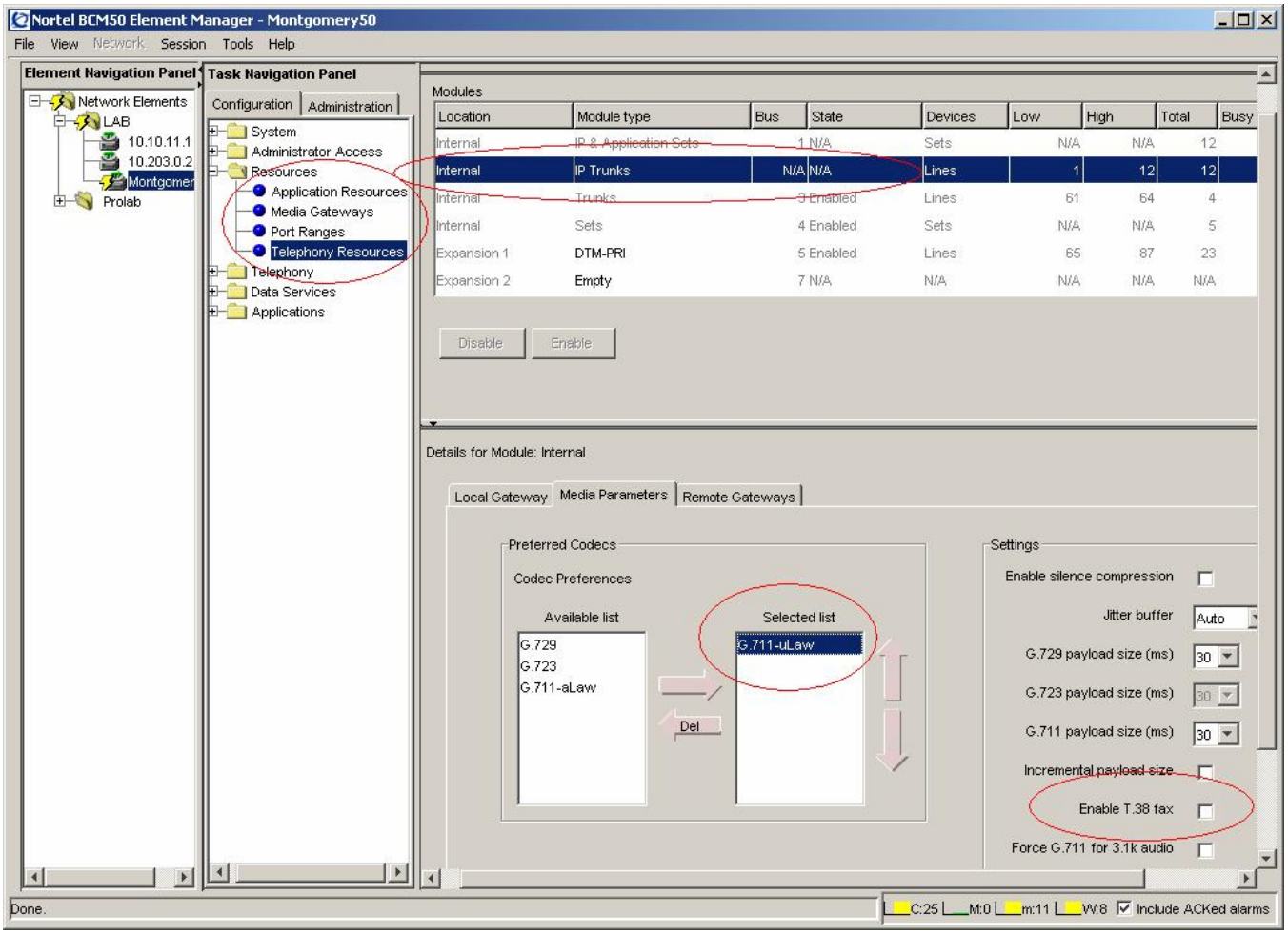

Figure 11

At this point the BCM50 configuration should be complete.

2.4.2 Mediatrix® Configuration

2.4.2.1 Mediatrix® IP Address Assignment

Mediatrix® 1102 ® configuration

Mediatrix® ships a GUI based configuration tool named “Unified Manager Client”® (UMC) with each of the analog gateways. The UMC is used to manipulate the MIB variables that define the configuration on the gateway. Out of the box, the gateway requests an IP address utilizing DHCP. To complete the IP address assignment, a reservation for an IP address was created in the existing scope for our setup. The MAC address is located on the box. The MAC address must be used when defining a reservation within a DHCP scope.

By creating a reservation, the IP address of the gateway is always known allowing for simplification of management.

2.4.2.2 Mediatrix® GUI Install

The UMC install is a straightforward windows installation. The CD is placed in the CD drive and autorun should launch a web page which will guide you through the setup. If autorun does not launch the web page, file explorer can be used to navigate to the root of the CD where you will find a HTM file named “ReadMeFirst.htm”. Double click this file and it will launch a web browser with a start page.

2.4.2.3 Device Discovery

Once the UMC application is installed and launched, the Mediatrix ® gateway will need to be discovered. To accomplish this, right click on the Unit Manager icon on the left and select “Autodetect”. This will allow you to put a range of addresses to scan for a Mediatrix® gateway. In this case we have one address. The address used for our testing was 10.1.1.240. Once you have defined the range to search select “start”. When the gateway is discovered and selected, click “ok”.

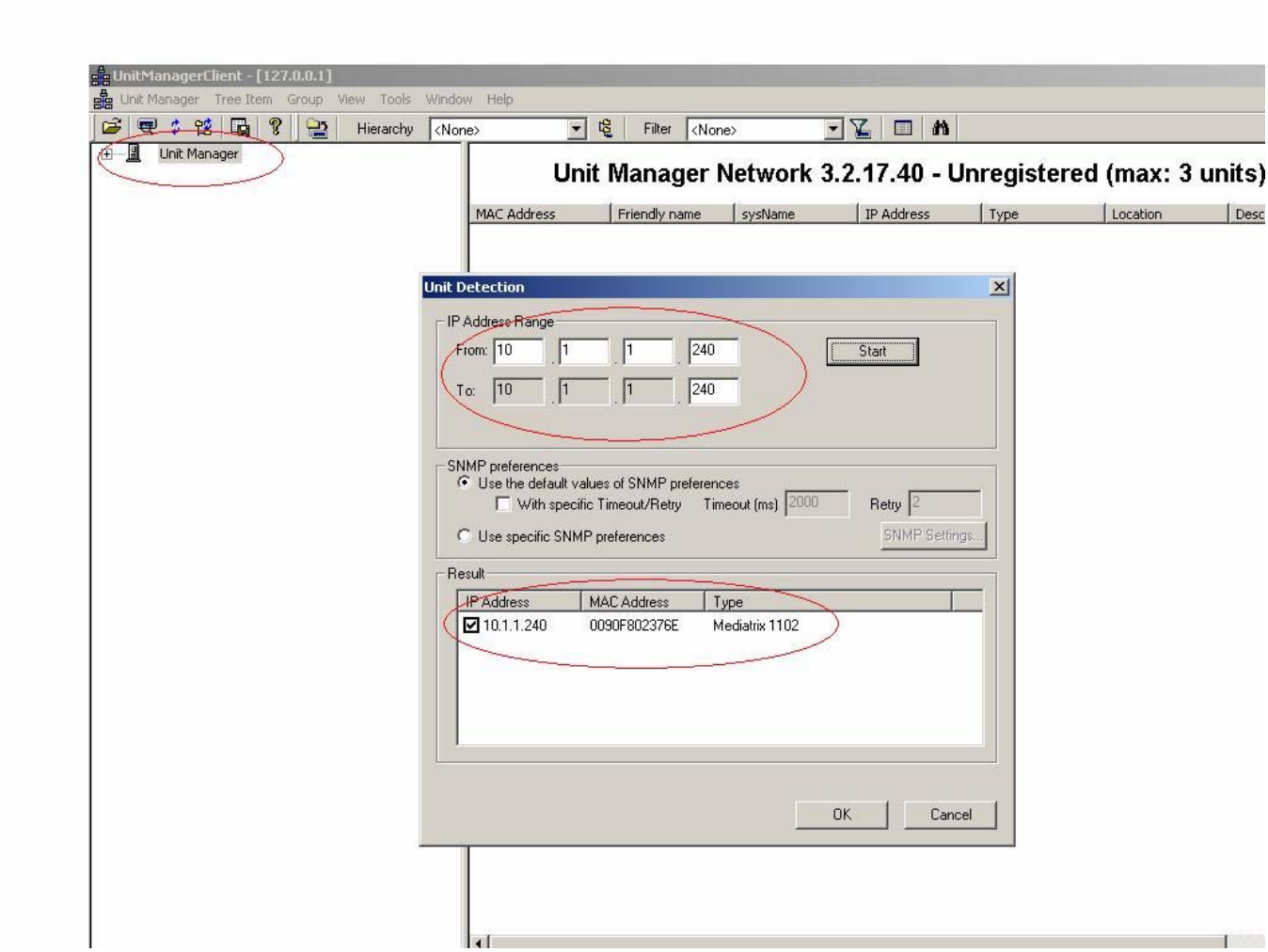

Figure 12

Once the device is discovered, the gateway will show up under the Unit Manager tree. Once under the Unit Manager tree the properties of the gateway can be expanded.

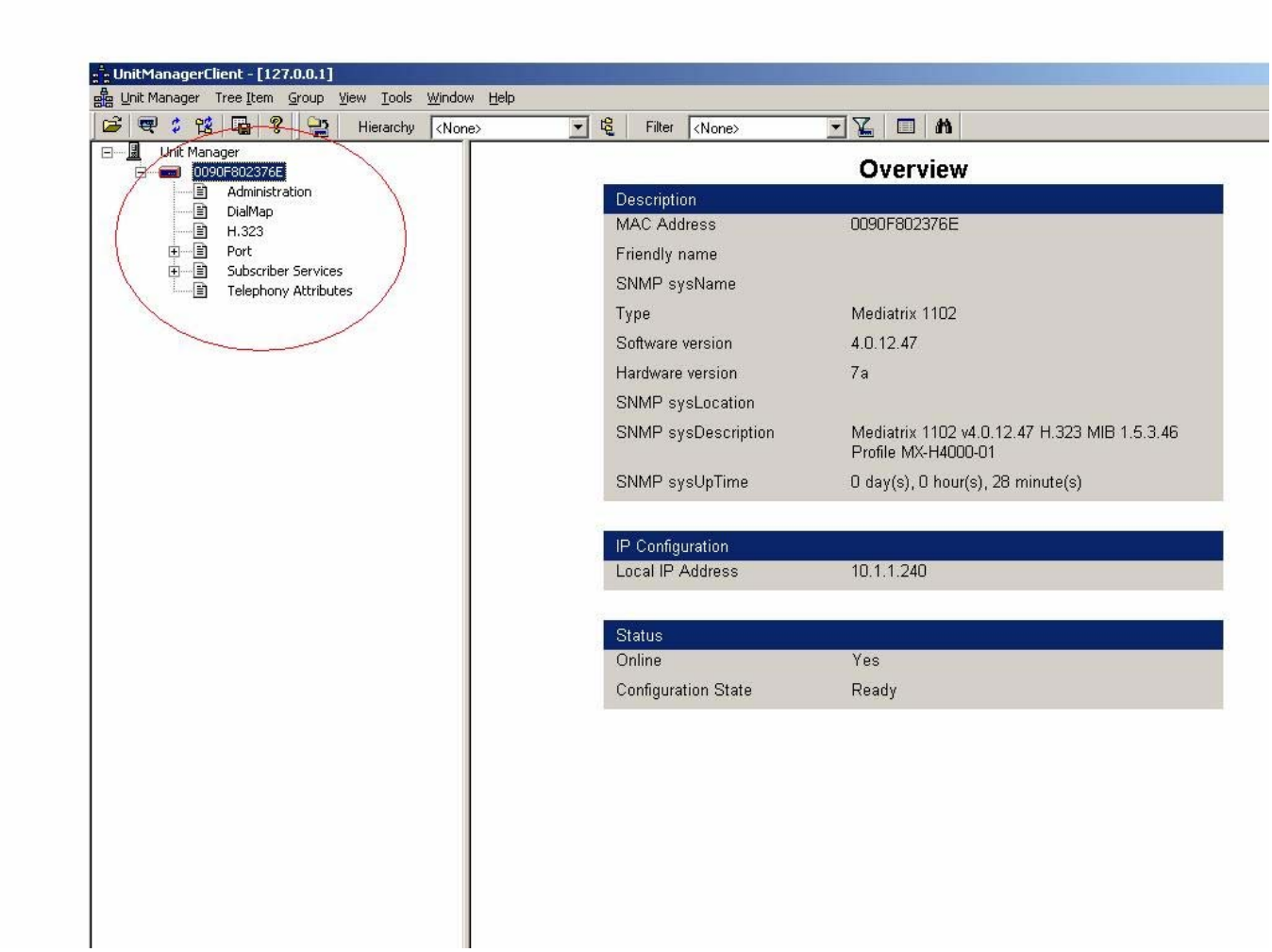

Figure 13

2.4.2.4 H.323 and Port Configuration

Now the gateway is ready for a configuration. To get the gateway up and running with the BCM50, the H.323 and port configuration needs to be completed first.

Right Click on H.323 and select “Edit”. The H.323 properties screen appears. On the properties screen you need to set the following:

Registration Method set to “none” since a gatekeeper is not being used.

An alias must be defined on a per port basis. For this setup, only 1 port was used. Port 1 was defined with a 7 digit phone number with a type of E164 (National). This is the phone number that corresponds to the port. If the incoming dialed phone number matches the number defined on the port and the type matches, the port will ring the analog device. The number and type defined on the gateway corresponds to the route and destination digits that were defined previously on the BCM50 to connect to the gateway.

Once these settings have been made, “Direct Gateway Call” button must be selected. Select “ok” when done.

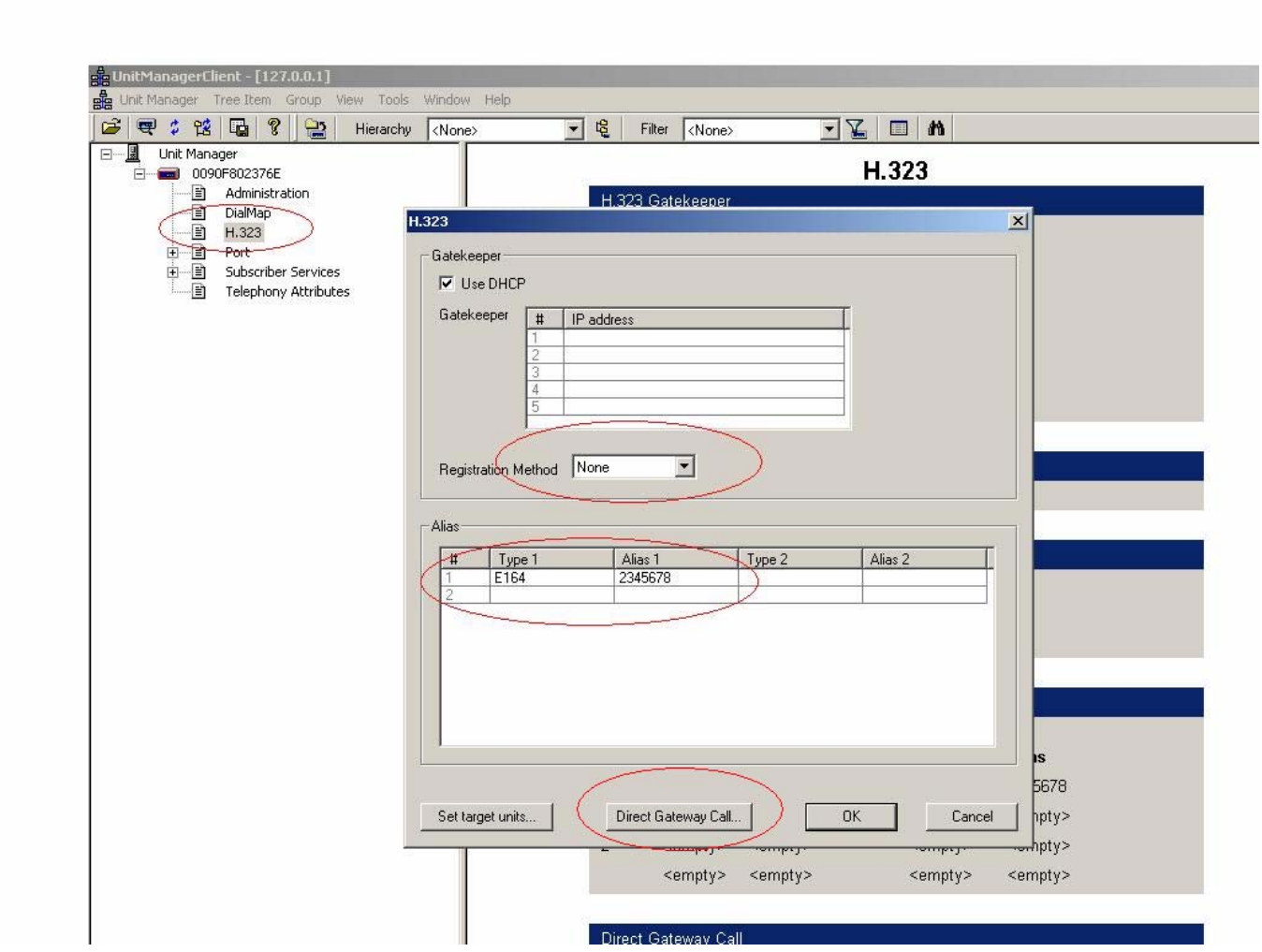

Figure 14

2.4.2.5 Direct Gateway Configuration

The “Direct Gateway Call” must be defined since a gatekeeper is not being utilized. This is equivalent to the remote gateway configuration on the BCM50.

The analog port being configured is set to “enable” and the IP address of the BCM50’s advertised IP telephony address is defined. This is where all calls will be routed originating from analog port 1 on the gateway. When completed select “ok”

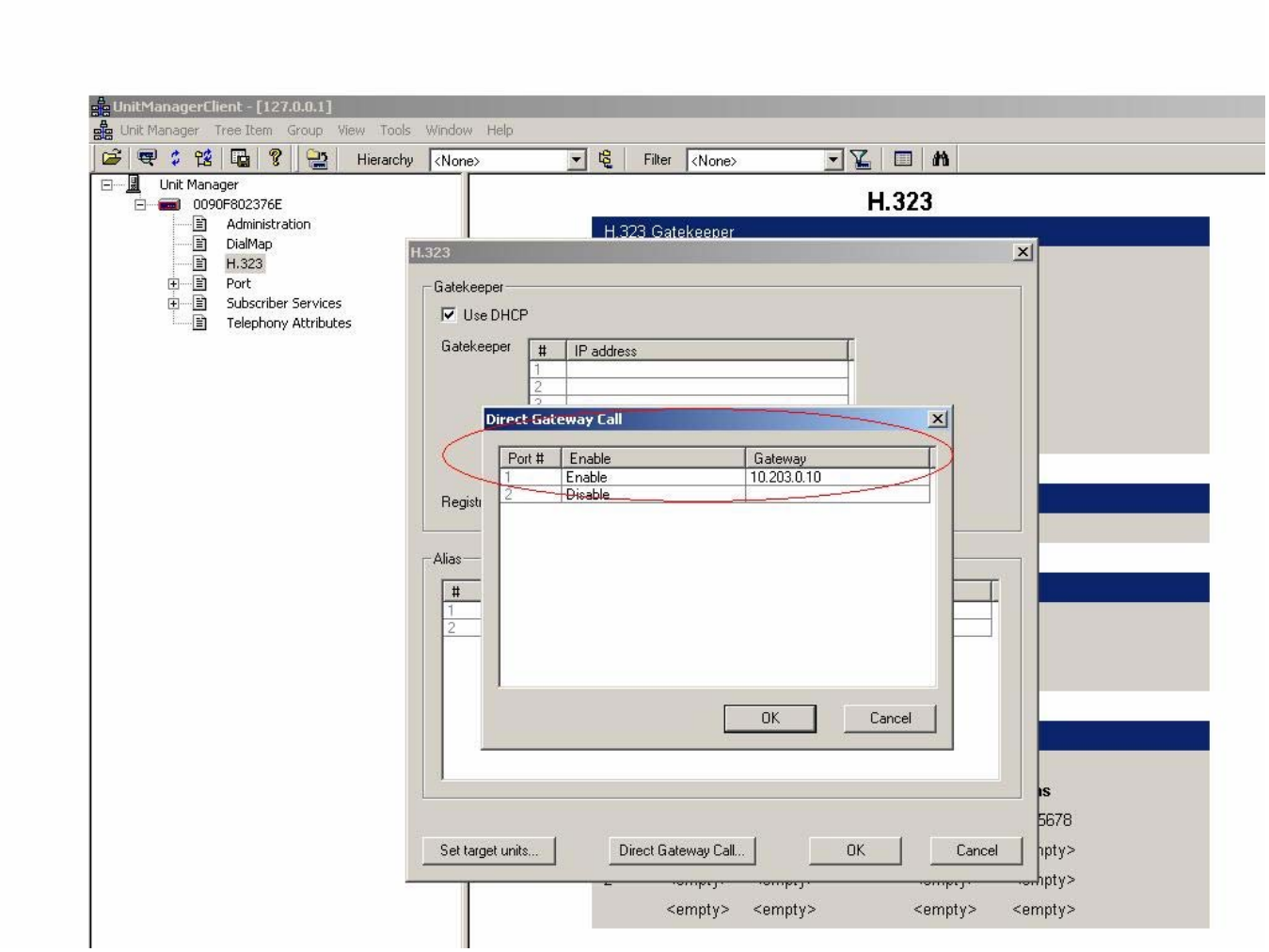

Figure 15

2.4.2.6 Gateway CODEC Definition

Once the direct gateway is configured, the CODEC for the individual analog ports need to be defined. To change the codec, expand the “port” option on the tree so that “port” and the child item to port, “codec activation” is showing.

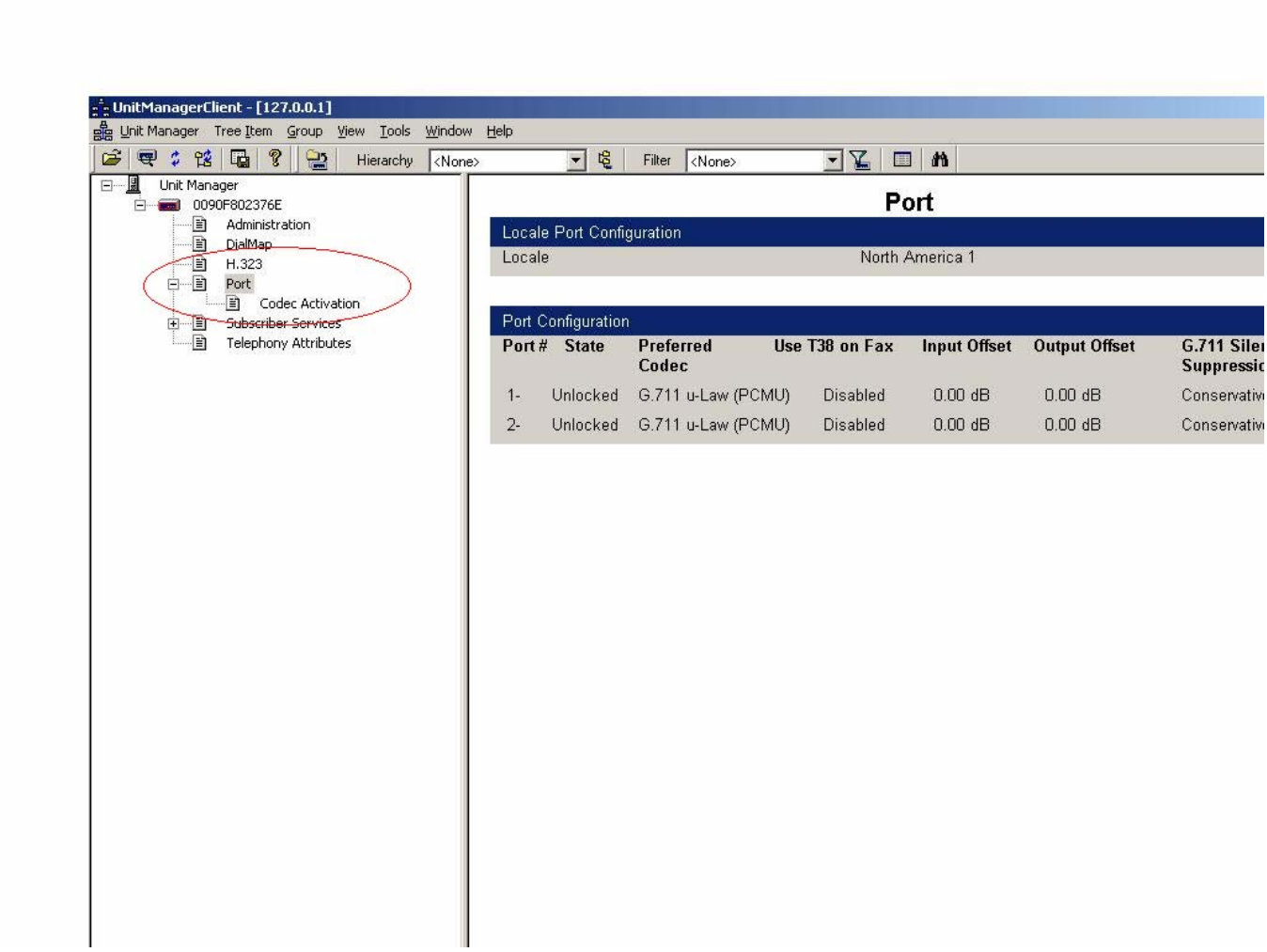

Figure 16

Right click on “port” and select “edit”. The “port” properties page appears. Set the preferred codec to “G.711 mu-law (PCMU)” and T38 fax to “Disabled”. The country locale is set to “North America 1”. Click on “OK”.

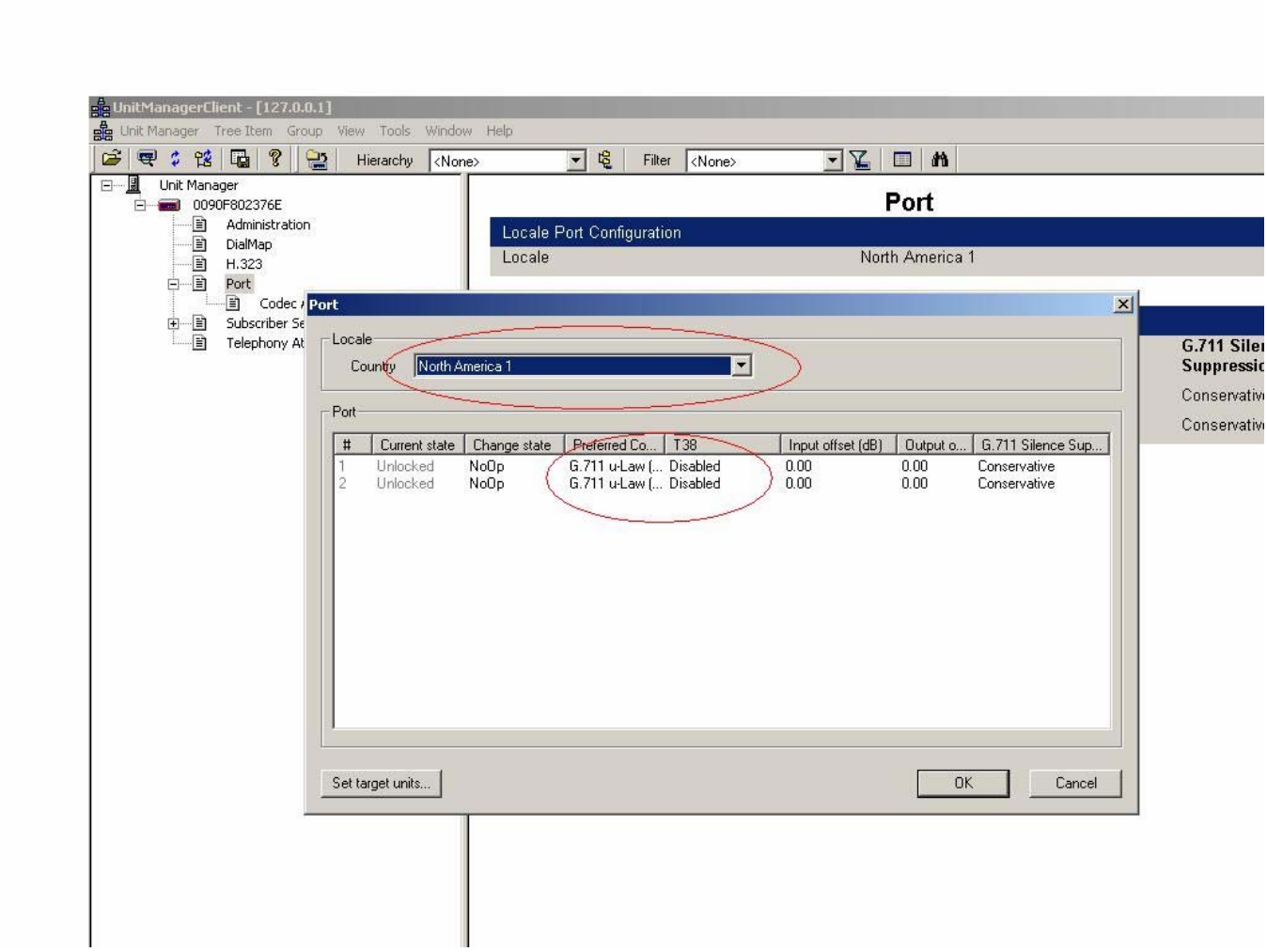

Figure 17

Right click on “codec activation” under “port” on the tree and select “edit”. The codec activation screen appears. Disable all codecs except for G.711 mu-law. Select “OK” when completed.

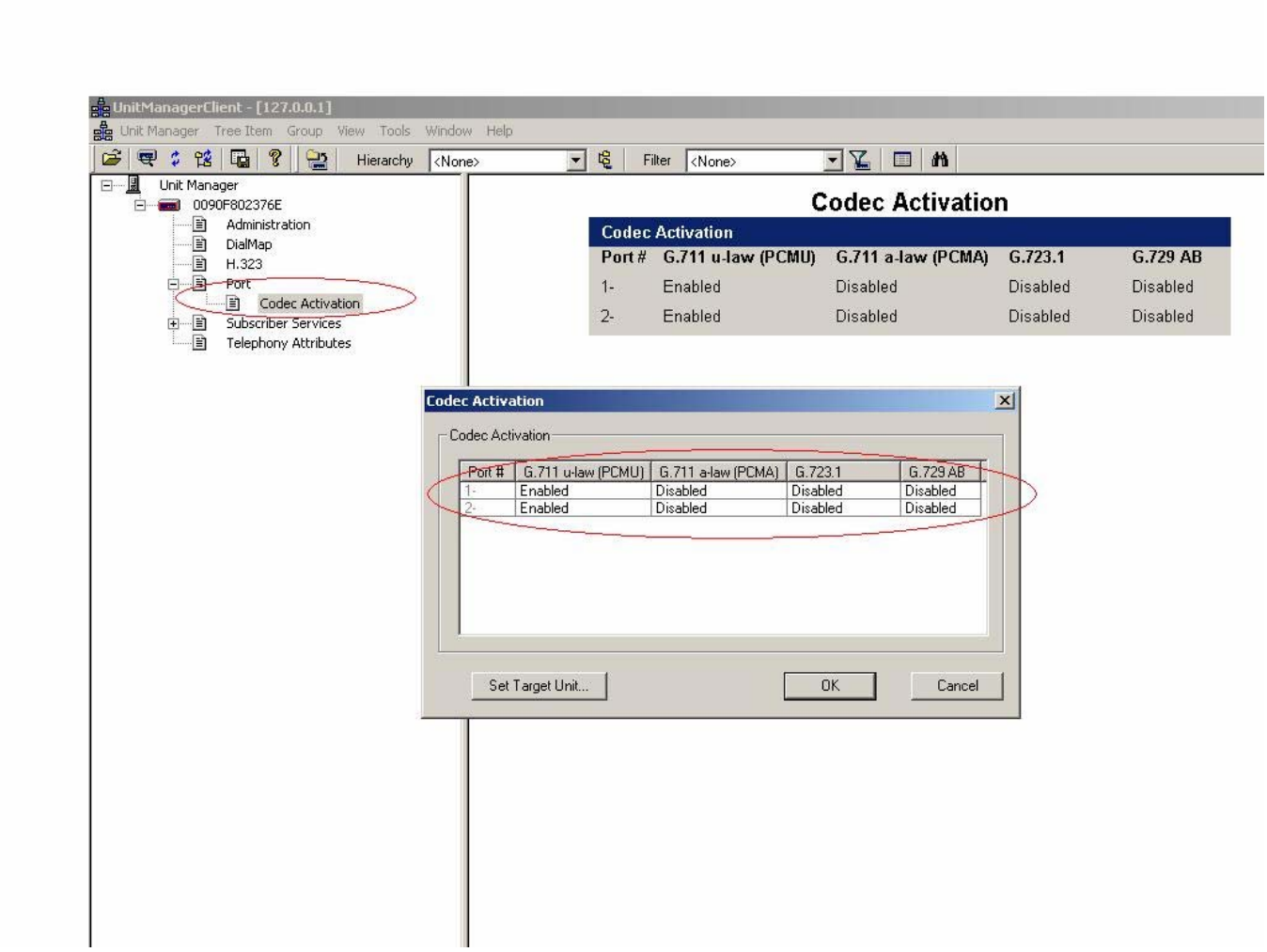

Figure 18

2.4.2.7 Mediatrix® Configuration Transfer

At this point the configuration needs to be transferred to the gateway. Right click on the MAC address of the gateway under the Unit Manager icon. Go to “configuration file” and “transfer to unit”. The configuration is now transferred to the gateway but is not yet active.

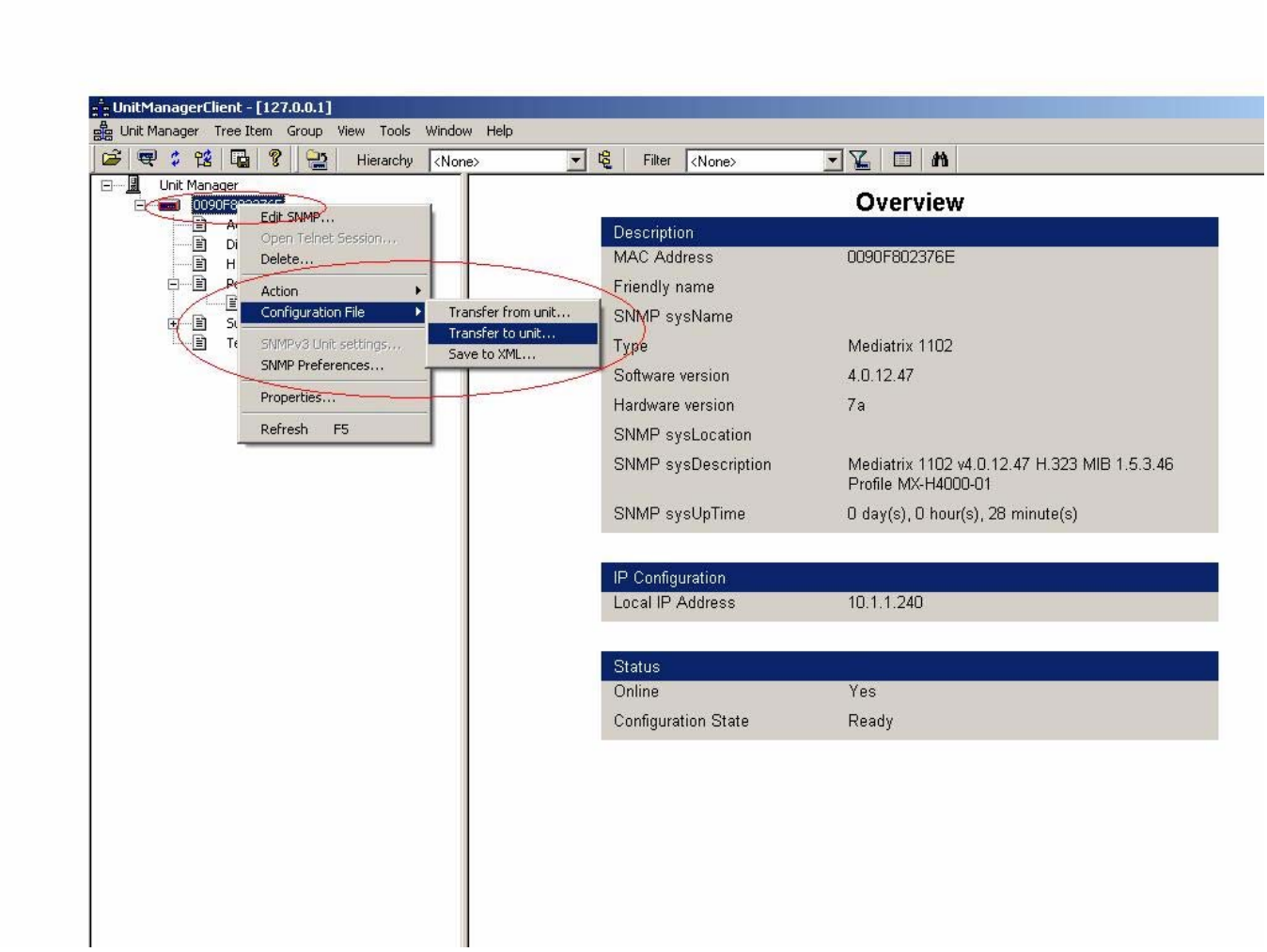

Figure 19

2.4.2.8 Packetization Time

Now the packetization time or PTIME needs to be defined to be inline with the BCM50. Access this parameter by right clicking on the MAC address of the gateway under the Unit Manger icon and selecting “edit snmp”.

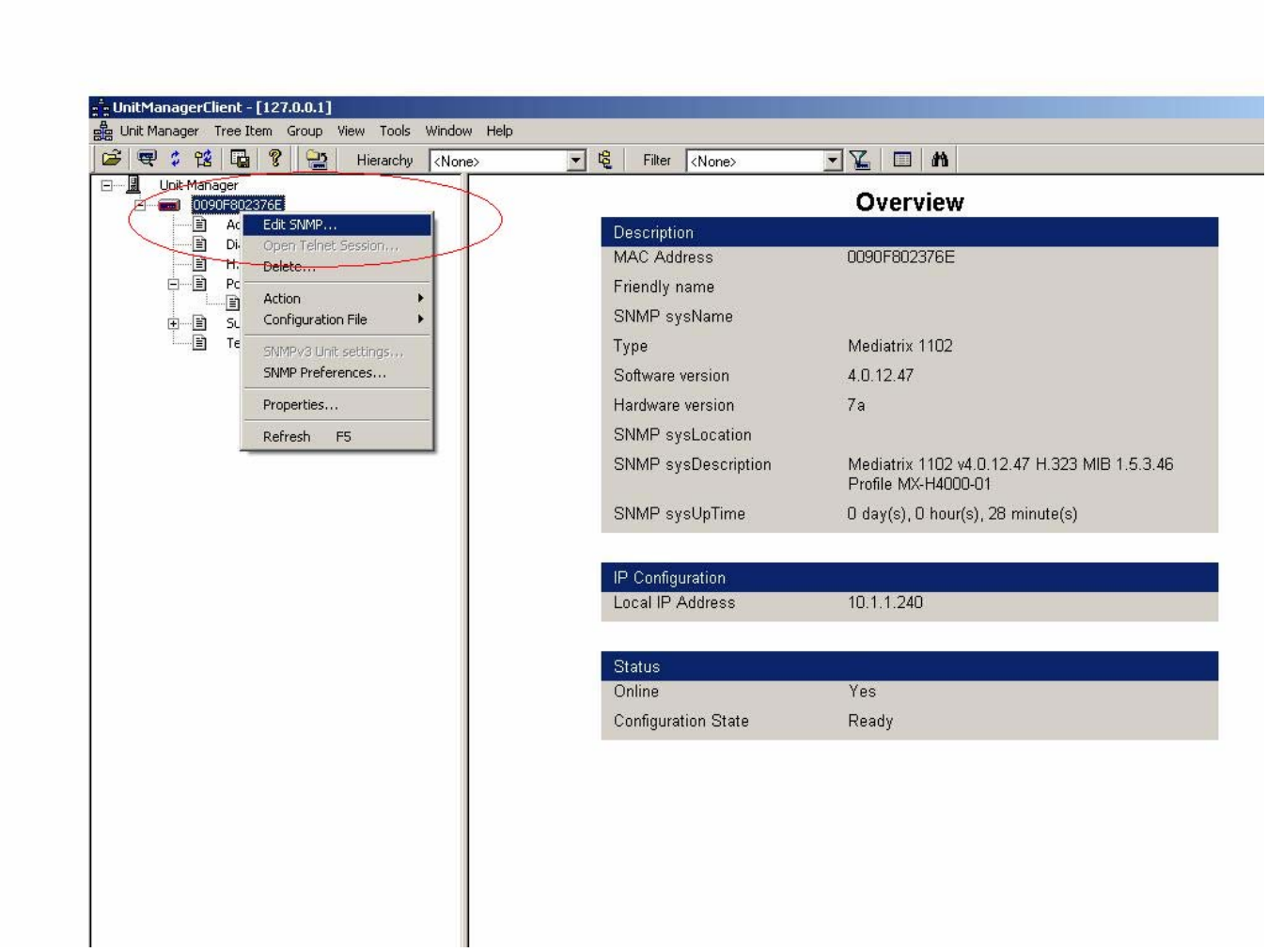

Figure 20

Once selected the entire MIB structure of the Mediatrix ® gateway is displayed.

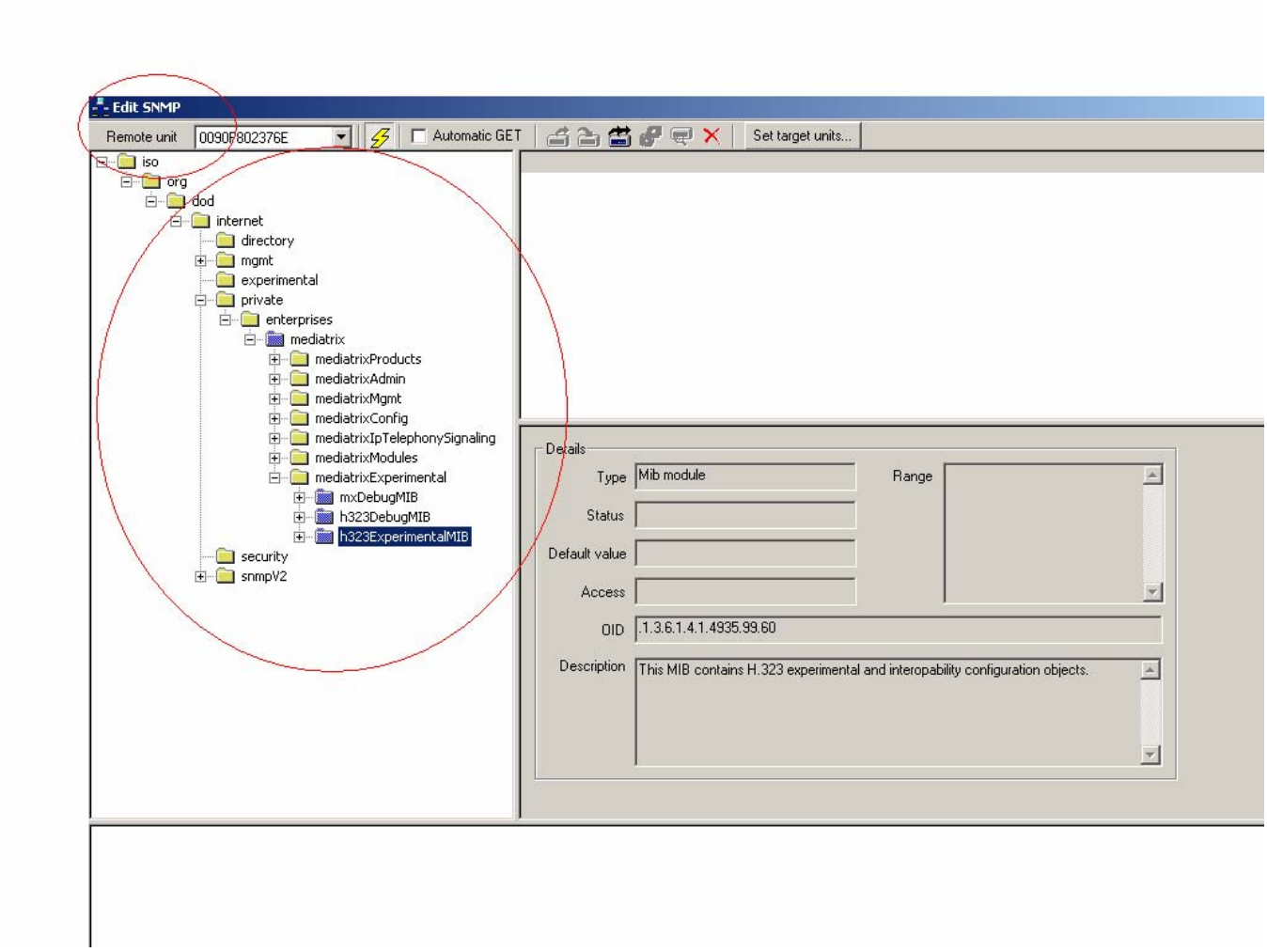

Figure 21

Do a Get on the OID (Object ID) Mediatrix.mediatrixConfig.voiceIfMib.voiceIfCodecTable by right clicking on the Mib and selecting “get”.

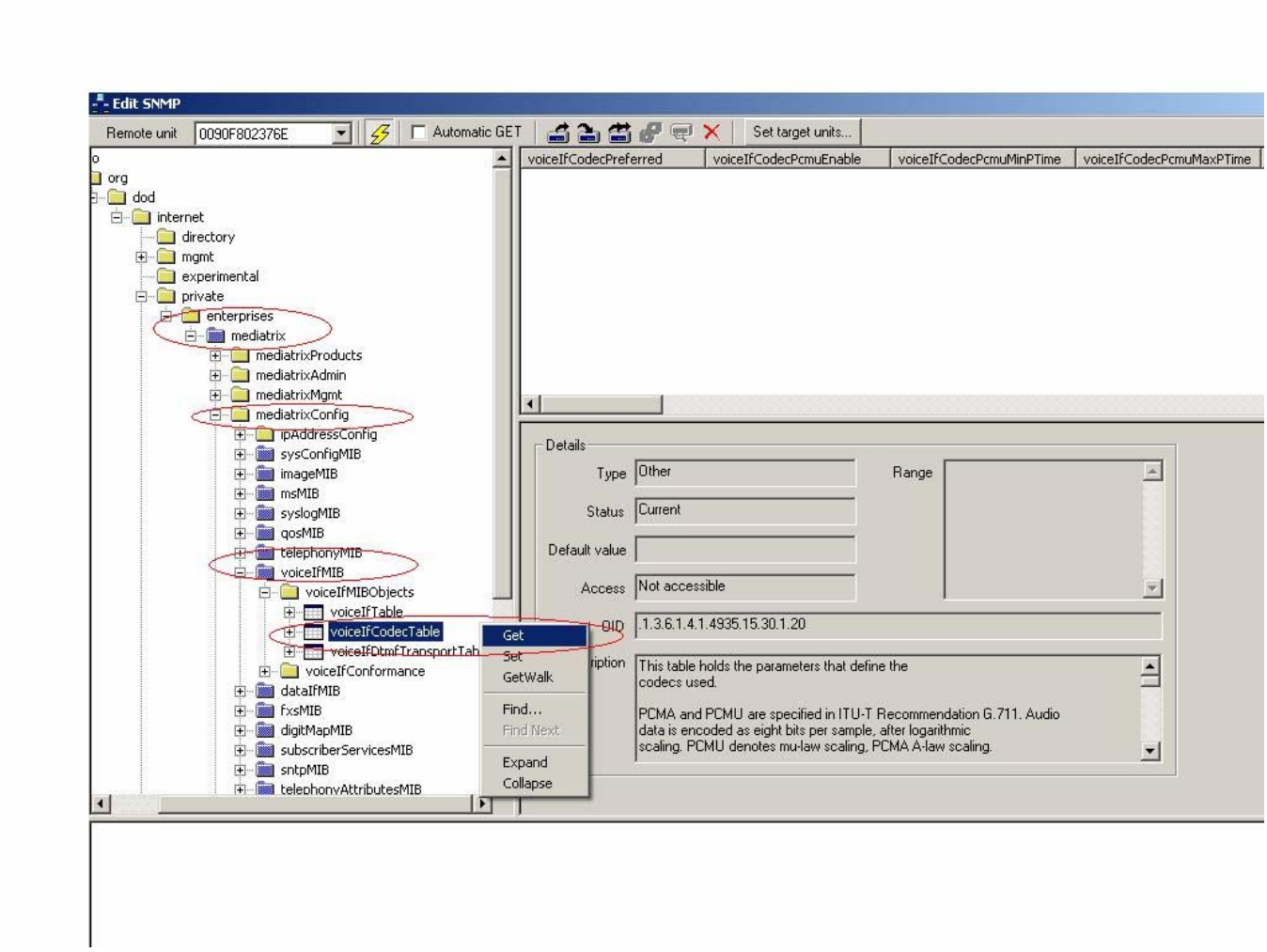

Figure 22

After you execute the get you need to Double click in the voiceIfCodecPcmuMaxPTime field and set the parameter to an integer value of 40. This sets the packetization rate between 10ms and 40ms for PCMU (G.711 mu-law). **Once the value is changed, the SNMP Set button at the top of the page must be selected or the change will not be transferred to the gateway.**

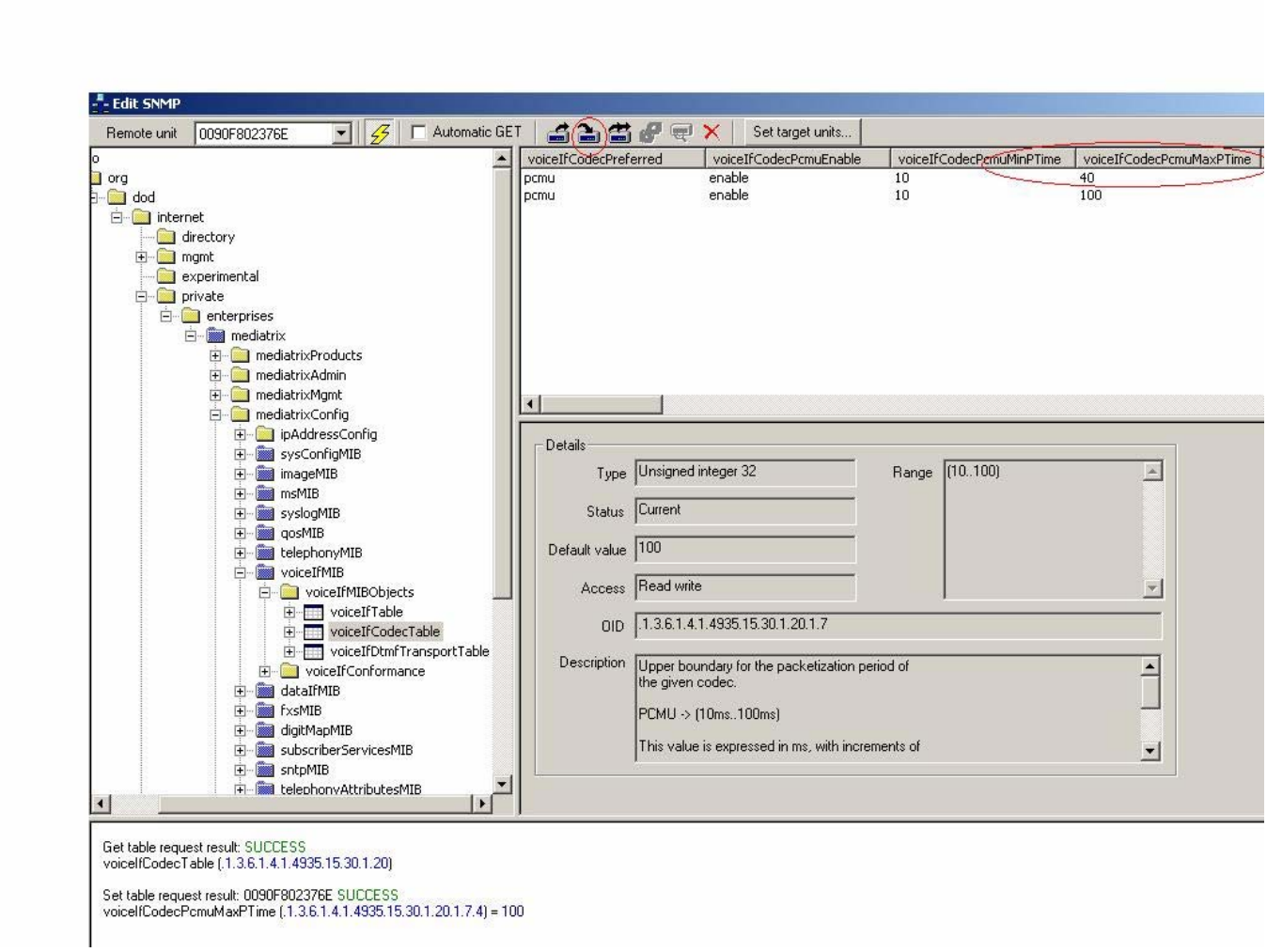

Figure 23

2.4.2.9 Out of Band Signaling

Out of Band Signaling now needs to be enabled. This is under the voiceIfDtmfTransport MIB. Right click and do a get. Once the values are displayed, change the voiceIfDtmfTransport option from “InBand” to “outOfBandUsingSignalingProtocol”. Once changed, click on the Set Icon at the top of the page.

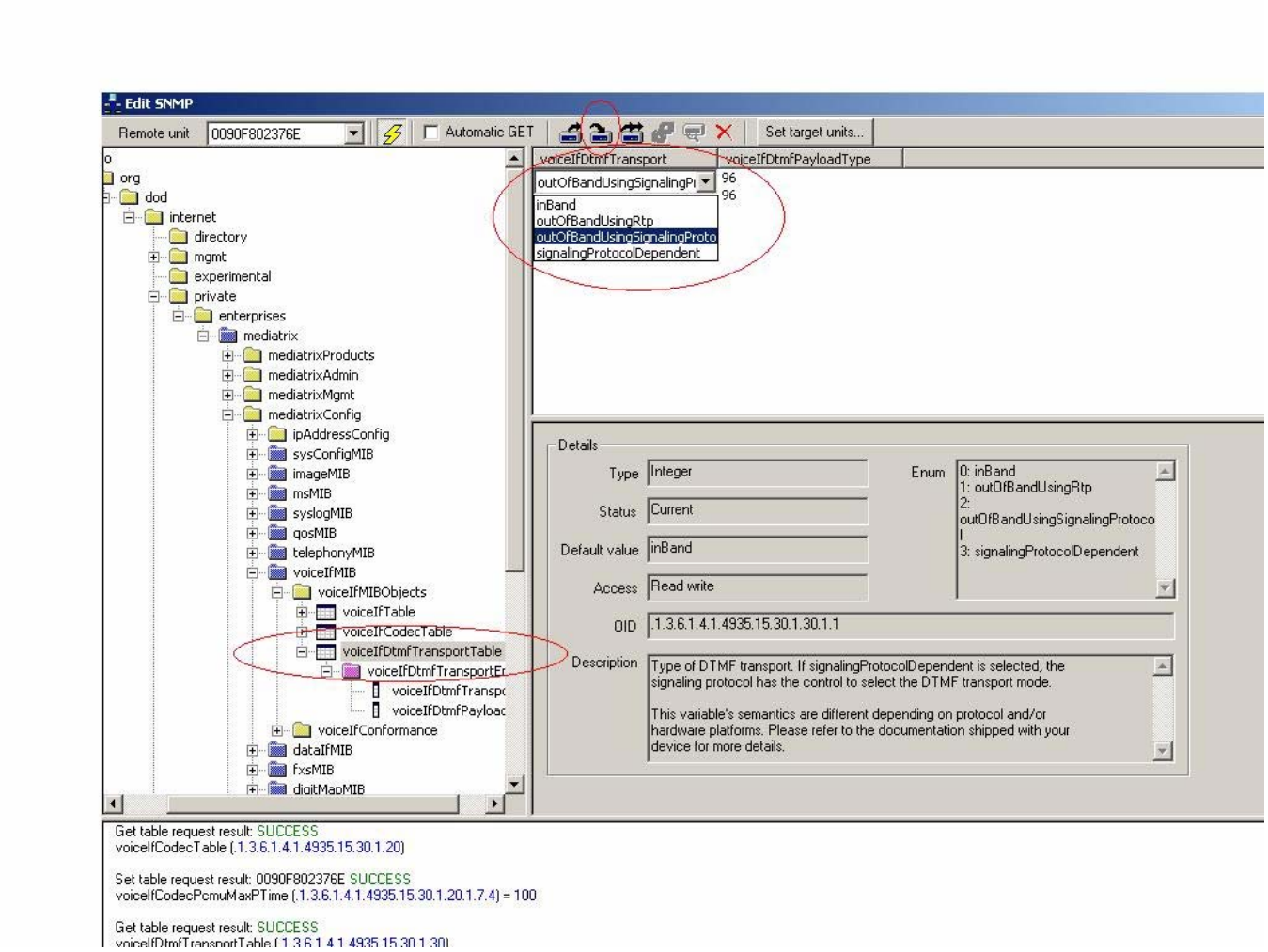

Figure 24

2.4.2.10 Alias Type Restriction

Navigate to the h323AliasTypeRestriction MIB and change the value to “disable”. Click on the SNMP set icon at the top of the page.

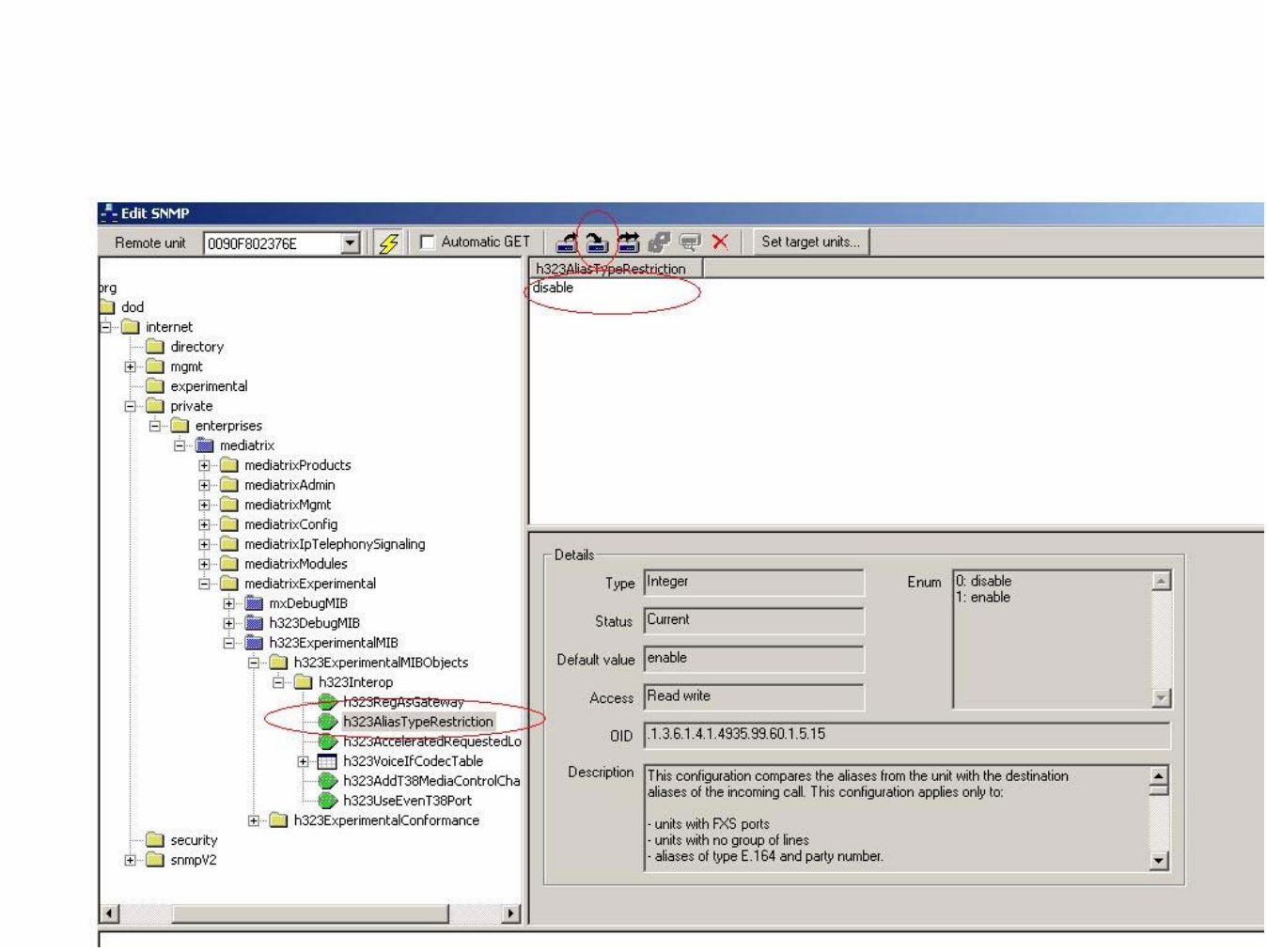

Figure 25

2.4.2.11 Gateway Configuration Activation

When completed, close the Edit SNMP page. At this point, the config should be transferred again to the gateway by right clicking on the MAC address under the Unit Manager icon and navigating to “configuration file” and selecting “transfer to unit”.

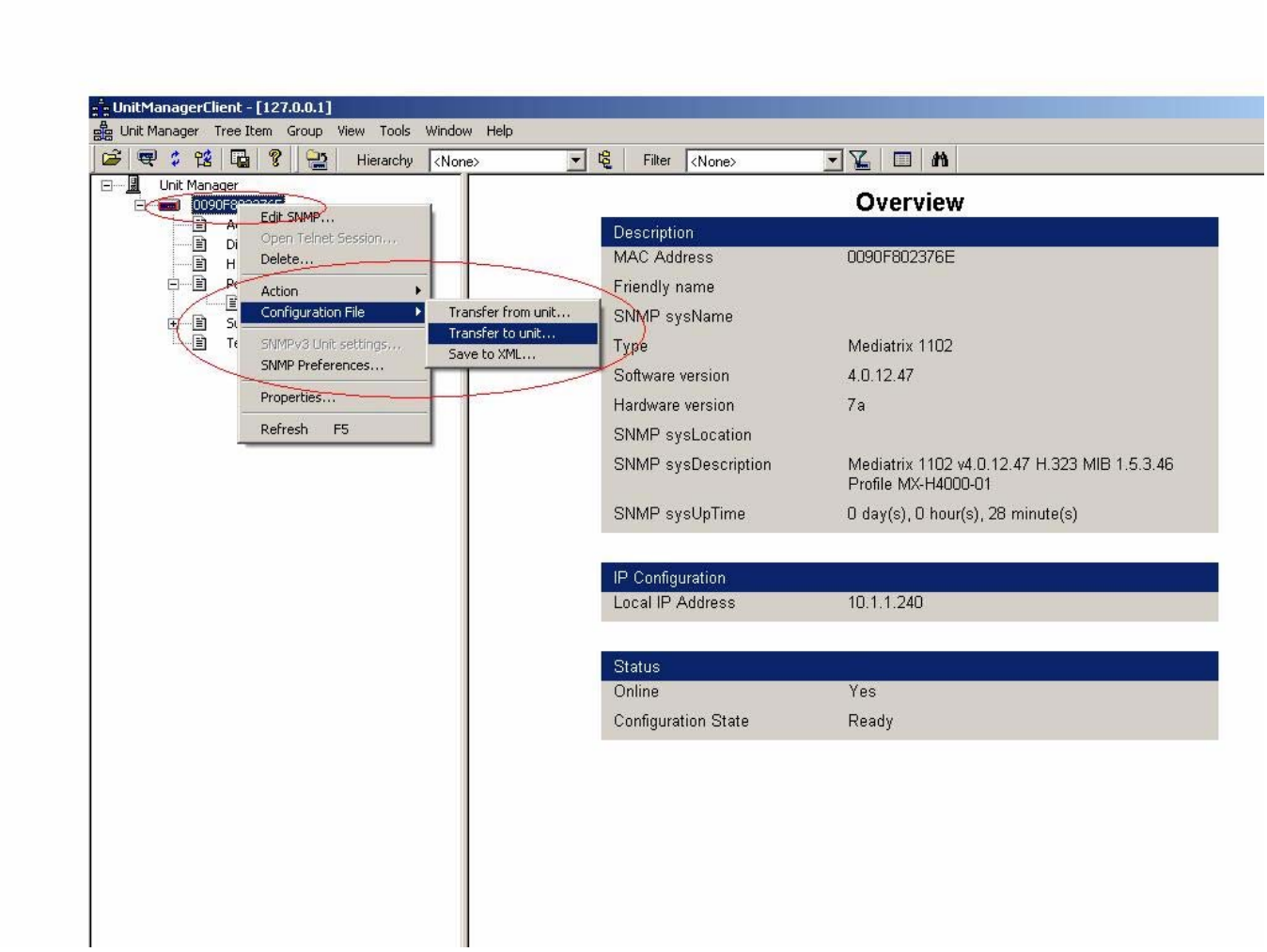

Figure 26

Once transferred, the gateway needs to be restarted for the config changes to become active. Right click on the MAC address under the Unit Manager icon, navigate to “action” and select “Restart (graceful)”. The gateway will restart and load the new config.

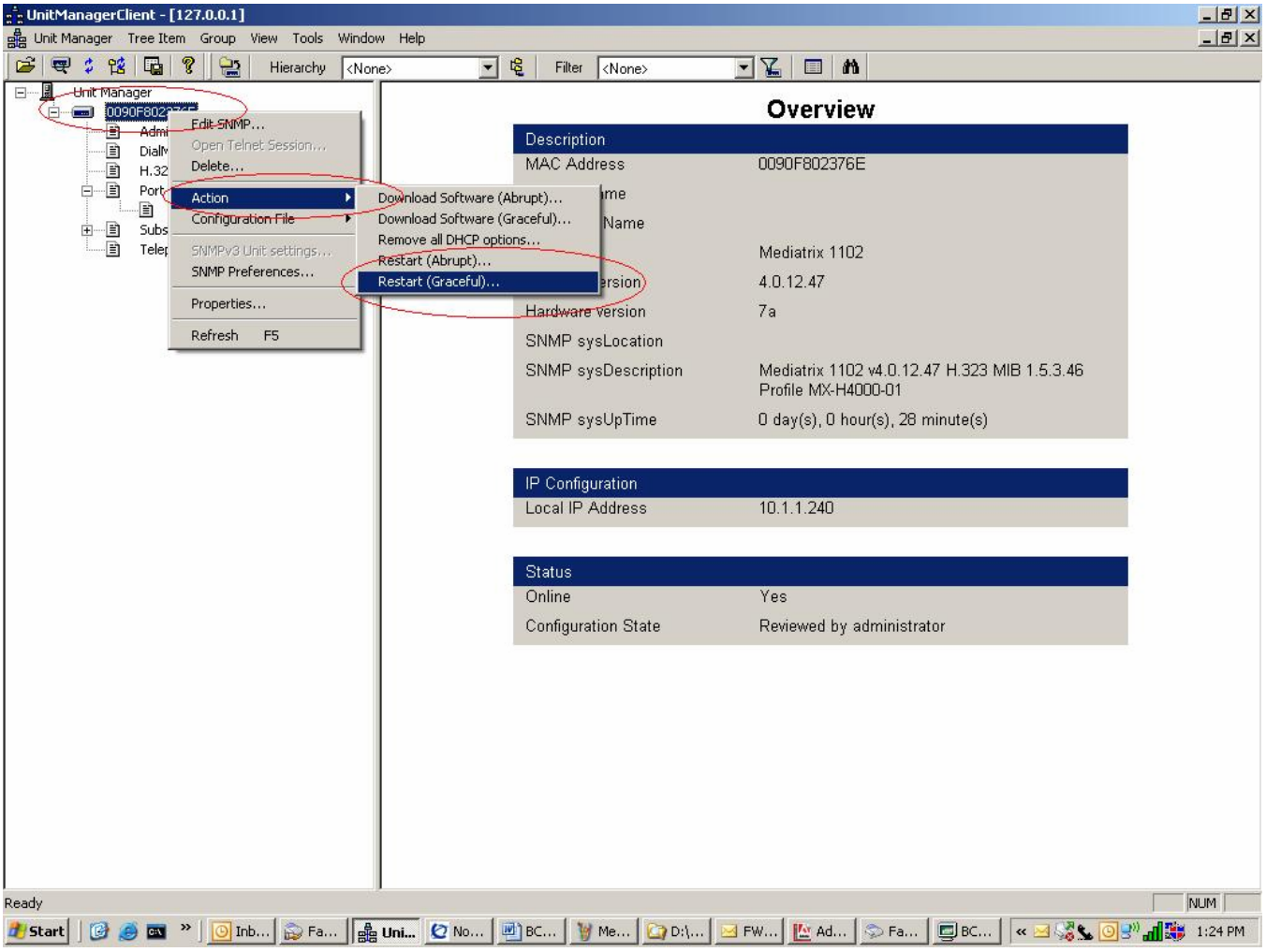

Figure 27

This should complete the Mediatrix® configuration steps.

2.5 Verification:

The most useful tool in troubleshooting the setup is the BCM monitor. By utilizing the BCM monitor, tandem functionality and call setup can be verified.

External calls to the Mediatrix®

The first thing to verify is that the calls are incoming and outgoing appropriately. In the below screen shot, the call is incoming on Line 065 and tandeming through to Line 006. This is an incoming call on the PRI and Outgoing call on the VoIP line and the call is in a connected state.

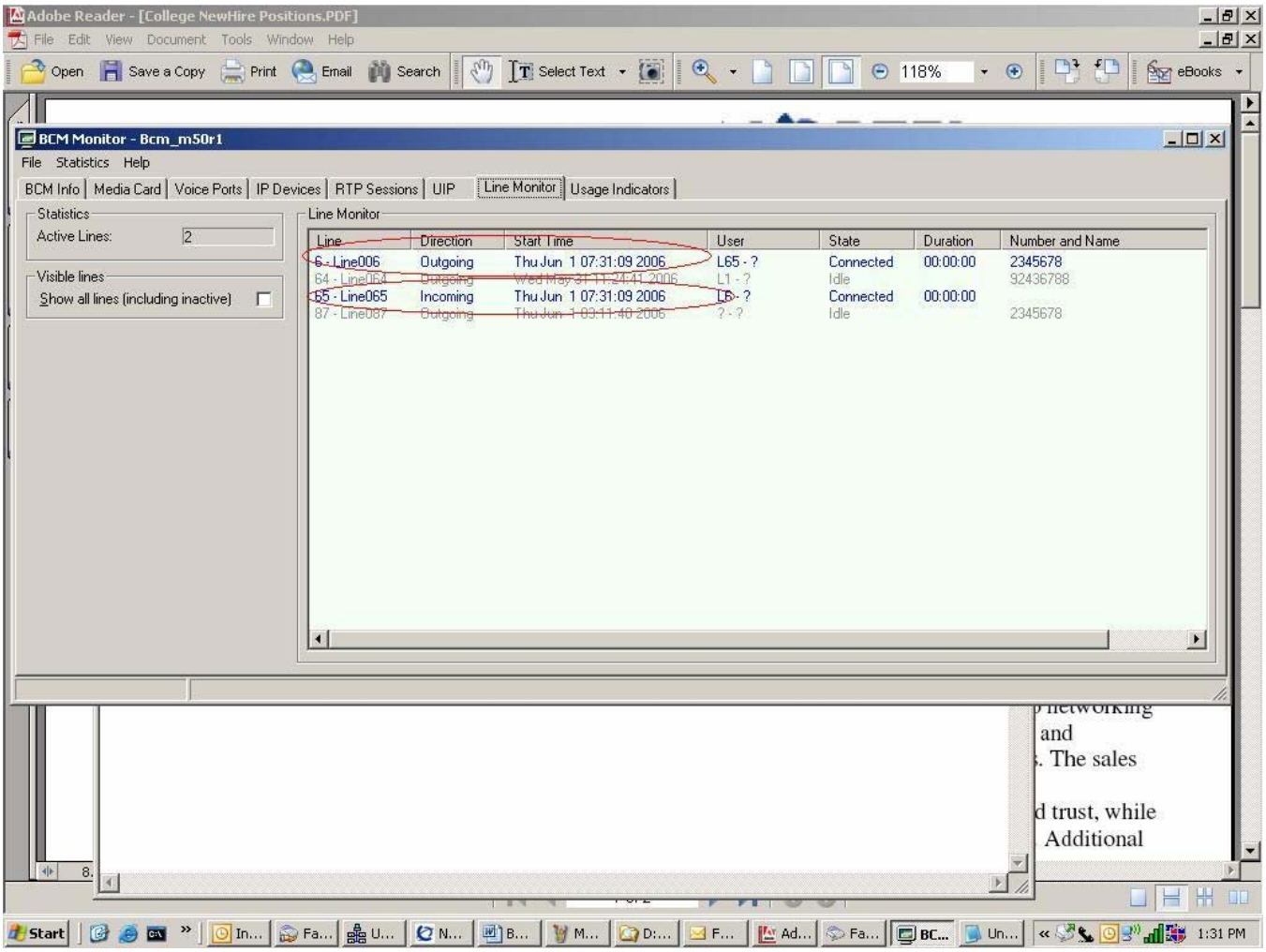
Adobe Reader - [College NewHire Positions.PDF]
BCM Monitor - Bcm_m50r1
File Statistics Help
BCM Info | Media Card | Voice Ports | IP Devices | RTP Sessions | UIP | Line Monitor | Usage Indicators
Statistics
Active Lines: 2
Visible lines
Show all lines (including inactive)
Line Monitor
Line | Direction | Start Time | User | State | Duration | Number and Name
6 - Line006 | Outgoing | Thu Jun 1 07:31:09 2006 | L65 - ? | Connected | 00:00:00 | 2345678
64 - Line064 | Outgoing | Wed May 31 11:24:41 2006 | L1 - ? | Idle | | 92436788
65 - Line065 | Incoming | Thu Jun 1 07:31:09 2006 | L6 - ? | Connected | 00:00:00 |
87 - Line087 | Outgoing | Thu Jun 1 03:11:40 2006 | ? - ? | Idle | | 2345678

Figure 28

If all digits are not being passed to the Mediatrix ® (example 2345 is being sent instead of the full string 2345678), digits could be possibly absorbed as part of the BCM50 destination digit configuration referenced in Figure 4.

Outbound calls from the Mediatrix® to External.

For calls originating on the gateway a VoIP trunk will be used for the incoming call and an external PRI trunk is used for the outgoing call. In this example, VoIP line 001 is used for the incoming call and PRI line 087 is used for the external trunk.

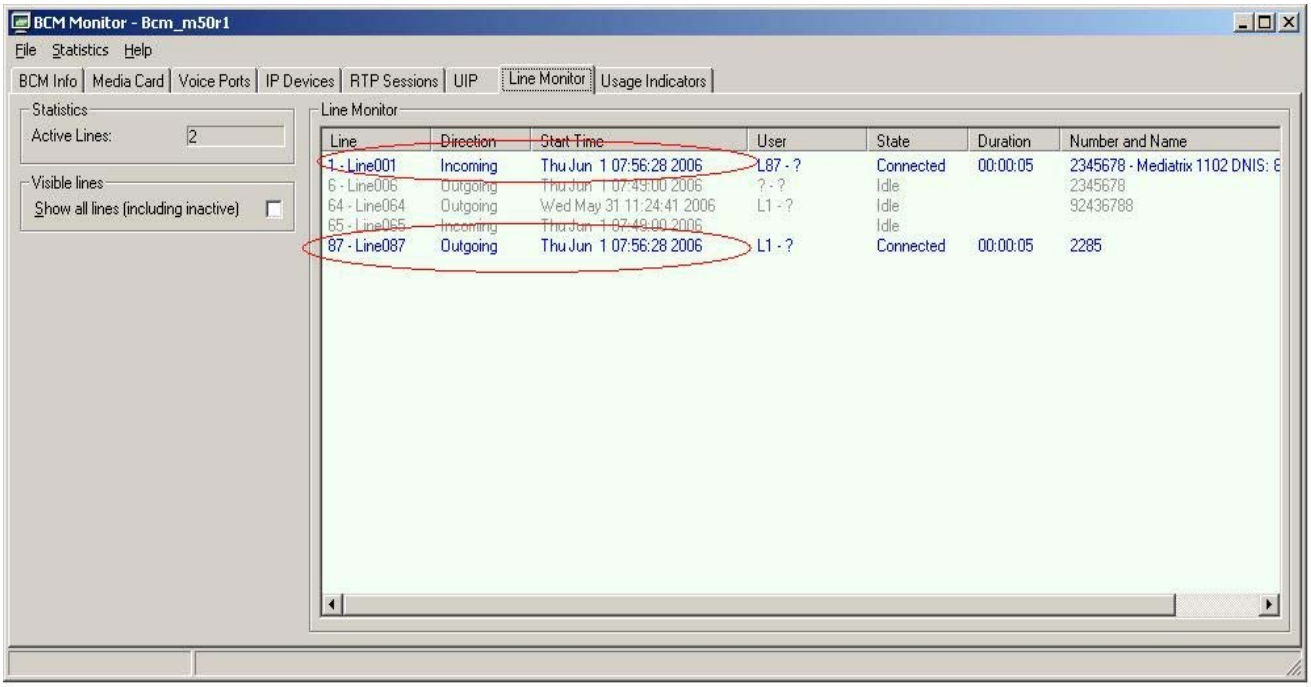
BCM Monitor - Bcm_m50r1
File Statistics Help
BCM Info | Media Card | Voice Ports | IP Devices | RTP Sessions | UIP | Line Monitor | Usage Indicators
Statistics
Active Lines: 2
Visible lines
Show all lines (including inactive)
Line Monitor
Line | Direction | Start Time | User | State | Duration | Number and Name
1 - Line001 | Incoming | Thu Jun 1 07:56:28 2006 | L87 - ? | Connected | 00:00:05 | 2345678 - Mediatrix 1102 DNIS: 8
6 - Line006 | Outgoing | Thu Jun 1 07:49:00 2006 | ? - ? | Idle | | 2345678
64 - Line064 | Outgoing | Wed May 31 11:24:41 2006 | L1 - ? | Idle | | 92436788
65 - Line065 | Incoming | Thu Jun 1 07:48:09 2006 | | Idle | |
87 - Line087 | Outgoing | Thu Jun 1 07:56:28 2006 | L1 - ? | Connected | 00:00:05 | 2285

Figure 29

3. Software Baseline:

Hardware Matrix

Manufacturer	Platform	Model	Version
Nortel ®	BCM	50	1.1 with cumulative patch 1
Mediatrix ®	Analog Gateway	1102 ®	4.0.12.47
Mediatrix ®	Unit Manager Client		3.2.17.40
Nortel ®	Enterprise Switch	470	3.6.0.6

4. Reference Documentation:

Document Title	Publication Number	Description
"Quintum Voice Over IP Gateway on BCM Technical Configuration Guide"		TCG Created by Pierre Fournier from Nortel
"Configuration Notes for Mediatrix FXS Units in Nortel CS1K Release 3 H.323 Environment"	0203	Mediatrix ® Configuration Note

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